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**ALONE IN THE
SLEEPING-SICKNESS COUNTRY**

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WATER LILIES ON THE OLASI RIVER

ALONE IN THE SLEEPING-SICKNESS COUNTRY

BY

FELIX OSWALD

D.SC., F.G.S., F.R.G.S.

WITH A MAP, AND OVER 70 PLATES
FROM THE AUTHOR'S PHOTOGRAPHS

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FOREWORD

Two years ago I was excavating a Roman camp near Nottingham, turning back the pages of history with the spade. A foot below the turf, on the rough pavement of a courtyard, lay a debased coin, minted after the abandonment of Britain by the Romans, and a gilt-copper horse-trapping of classical design but of Saxon workmanship. Eighteen inches below this level I found an older pavement of the courtyard, with many relics of the later Roman occupation in the overlying black earth; charred beams and swords told a story of disaster and destruction, dated approximately by coins to the period of the downfall of the British usurper Allectus and the re-establishment of Roman power by Constantine. A foot still lower down another pavement came to light, belonging to the early period of the Roman conquest and colonisation of Britain, with fragments of beautiful red vases made by a potter whose work has been found at Pompeii. Below this pavement there was still a thickness of four feet of black earth, accumulated during the long period when this ancient site was occupied by wild British tribes, before the advent of Roman civilisation and luxury. Here, too, there

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was evidence of a gradual improvement in culture, as shown by the changes in the form and quality of the pottery right down to the lowest level, where the potter's wheel was still unknown and the pots of the natives had been moulded inside baskets and only imperfectly burnt. The soil was full of charcoal and iron slag, and it was evident that iron ore was smelted in those days by our primitive ancestors in the same manner as by the natives of Central Africa at the present time. Often as I dug in the deep trenches and handled fragments of primitive water-jars, store-jars, or cooking-pots with rude, incised markings, or as I turned up a bronze brooch of crude design, I would pause to speculate on the mode of life of the many generations of our half-clad forefathers, especially of those living in the north of Britain; and I recalled the words of the historian Herodian, who, in describing the contemporary expedition of the Emperor Severus against the Caledonians of Scotland in A.D. 208, states that "they know not the use of clothing, but encircle their necks and loins with iron, deeming this an ornament and an evidence of opulence."

Two years later, whilst dwelling in my lonely camp on the cliffs of the Victoria Nyanza in the heart of Africa, close to the Equator, I found my questions answered; for here I was living in the midst of a tribe of naked savages, who ornamented themselves with coils of iron wire like the Caledonians, and, in short belonged to a similar stage

of the Early Iron Age, using the same forms of pottery with similar markings,—simple herdsmen and tillers of the soil, with primitive habits and customs, which (allowing for differences in climate and race) must have closely resembled those of the primitive inhabitants of our own islands.

In the following pages an attempt will be made to depict the habits and characteristics of these Kavirondo negroes, as seen when I lived alone amongst them at close quarters, only three weeks' journey distant from London, yet in a state of isolation and aloofness from the complex civilisation on which I had so recently turned my back, just as if some time-machine had suddenly whirled me backwards in the world's history for a period of two or three thousand years.

The immediate object of my journey to the Victoria Nyanza was, however, not to study the customs of a primitive and backward race of African negroes, but to pursue a geological investigation, on behalf of the British Museum, of some Miocene deposits found early in the year 1911 by Mr. G. R. Chesnaye near Karungu, on the east coast of the lake. Subsequently Mr. C. W. Hobley, c.m.g., H.M. Provincial Commissioner, who has done so much for the natural history and anthropology of British East Africa and Uganda, presented to the British Museum a fragmentary mandible of a *Dinotherium* (a far-distant relative of the elephant, with tusks in the lower jaw curving

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downwards somewhat like the tusks of a walrus), as well as a few other fossils (e.g. rhinoceros, tortoise, turtle and crocodile), which had been collected at his instigation by the late Mr. D. B. Pigott, a Government official of British East Africa. Unfortunately, Mr. Pigott was killed shortly afterwards on the Victoria Nyanza by crocodiles, owing to the upsetting of his raft by a hippopotamus he had wounded. Much interest had been aroused in scientific circles when the specimen was described by Dr. C. W. Andrews, F.R.S.¹; and, since nothing was known of the nature of the deposits in which it had been found, I offered to utilise my leave in the winter of 1911-12 in collecting specimens and in making a thorough examination of the locality. By the generosity of Mr. Charles B. C. Storey, F.G.S., and also of the late Rev. R. Ashington Bullen, F.G.S., Sir Henry Howorth, F.R.S., Dr. G. B. Longstaff, F.G.S., Dr. A. Smith-Woodward, F.R.S., Pres. G. S., Mr. W. Heward Bell, F.G.S., Mr. H. R. Knipe, F.G.S., the late Mr. W. H. Sutcliffe, F.G.S., and Mr. W. E. Balston, F.G.S., the expenses of my journey were defrayed, and I received the privilege of free transport on the Uganda Railway at the desire of the Colonial Secretary, to whom I also wish to tender my grateful acknowledgments.

¹ "On a New Species of *Dinotherium* (*D. Hobleyi*) from British East Africa," *Proc. Zoological Soc. of London*, December, 1911.

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ALONE IN THE SLEEPING-SICKNESS COUNTRY

CHAPTER I

ON THE VICTORIA NYANZA

My first step from the beaten track was due to force of circumstances rather than to deliberate choice. The necessity for breaking my journey at Nairobi in order to pay some indispensable official visits, and to make final preparations for my camp life of two months' duration, resulted in my missing the southward-bound steamboat from Kisumu (Port Florence) that touched at Karungu, the port for which I was destined. The next boat for Karungu did not leave for a whole fortnight, and, since every day of my limited time was precious, H.E. Sir Percy Girouard, K.C.M.G., at that time Governor of British East Africa, very kindly placed the Government schooner at my disposal, a small but trim vessel with a roomy cabin amidships. She was manned by three negroes and navigated with conspicuous ability by its captain or *howdar*, a native of Mwanza on the south coast of the Victoria Nyanza—a born sailor, able to thread the

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tortuous and rocky waterways of the lake as easily by night as by day, and familiar with every shoal and reef.

It was with sincere regret that I left the hospitable home of the Provincial Commissioner, Mr. John Ainsworth, c.m.g., with its garden gay with scarlet *Hibiscus*, crimson *Oleander* and golden *Allamanda*, and fragrant with Frangipanni (*Plumeria acutifolia*), roses and violets, whilst brilliant tropical butterflies sailed majestically from bloom to bloom in the dazzling sunshine. This was at the end of November, when London would be shrouded in fog or coated in rime. The charming garden is the result of a determined conquest by Mrs. Ainsworth of almost insuperable difficulties, for holes had to be quarried in the bare basalt and soil inserted before any plant or shrub could gain a foothold on these barren rocky heights above Kisumu.

At nine o'clock at night, preceded by a lantern-boy to guide me down the dark path to the harbour (recalling a similar experience on Lake Van in Armenia), I boarded the vessel, bidding farewell to civilisation. Heavy clouds rested on the lofty Nandi escarpment to the north, the sky was still fitfully lit up by throbbing and quivering lightning—the aftermath of one of Kisumu's usual violent storms of the afternoon—and a gentle breeze filled the sails as we steered westwards through the shallow and muddy Kavirondo Gulf. I had

not been long asleep when down came the rain in torrents in a thoroughly tropical manner; I awoke to find myself lying in a pool on a soaked mattress, tossed about in a cockle-shell of a boat on a choppy sea, and it was some time before I could collect my scattered wits to realise where on earth I could be and whether I was still dreaming. Here a thunderstorm is no shower: it is the bursting of a reservoir! The shipbuilder had inconsiderately arranged for the side-shutters to open inwards instead of outwards, so that the rain found a ready entry. With the help of my electric torch I struggled into dry clothes and curled myself up in a blanket in the middle of the cabin, snatching forty winks in spite of the hard boards and the attentions of innumerable little brown ants which swarmed all over the boat.

During the daytime little progress could be made, for the wind drops as the sun rises, and we were practically becalmed until the afternoon. A rushing, rustling sound, ever growing in volume, announces the advent of a huge flock of cormorants, in many hundreds, flying in serried ranks close to the surface of the lake. Suddenly there was a shock as if we had struck a rock, and the boat trembled from stem to stern; a snort close to the boat showed that a hippopotamus had grazed our keel in rising to breathe; twenty yards further on, the large pink nostrils just appeared again above the glassy waters. There is always some risk from

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these monsters in the case of a small boat on the lake, for many instances have been known when a hippopotamus, resenting the trespass into its domain, has torn out a boat's planks with its powerful tusks. Stanley himself was attacked whilst circumnavigating the Nyanza, and Sir Samuel Baker lost several men in this manner in descending the Nile from the Albert Nyanza.

It was in this part of the Kavirondo Gulf that the late Sir Clement Hill, during a voyage on a steam-launch, caught a glimpse of the *dingonek*, a mysterious sea-monster with a long neck, which apparently tried to seize one of the men at the prow. Some people are of opinion that this creature, concerning which many fabulous tales are told by the natives, is a large sea-python, and fishermen are said to be not infrequently attacked by it ; but it still awaits verification by means of the sportsman's gun.

As we drifted past many islands of matted vegetation, from which stems of papyrus rose gracefully swaying to and fro, a solitary pelican thoughtfully floated on the still, glassy waters, in solemn anticipation of its next meal ; large dragon-flies restlessly skimmed the surface ; and the sun, rising higher and higher in the heavens, scorched the deck as we lay becalmed, isolated from the world beneath a sky of brass. The heat became insupportable, and I could only just gasp for air and hope for a breeze. A couple of sea-gulls, mewing as if

in pain, added to the impression that I must have crossed Africa from ocean to ocean, instead of sailing on a sheet of fresh water, large enough, however, to enclose the whole of Scotland.

The scene was so innocent and peaceful that it was difficult to realise that swift and certain death lurks in these waters swarming with crocodiles. Only a few months previously a Government official went out on a raft in Homa Bay to shoot a hippopotamus: the wounded leviathan turned in its fury upon the raft and tore it to pieces, so that all the five occupants were thrown into the water. Four of them were instantly seized by crocodiles and were seen no more; the only survivor was a negro boy, who managed in the confusion to swim ashore. The crocodiles of the Victoria Nyanza have not the lethargic, immobile habits of the specimens in our Zoological gardens, but are alert, keen, and always ready for a meal. My friend, Mr. Hobley, was indeed once charged by a crocodile rushing down the bank of the lake-shore with such a ferocious onslaught that it was only a skilful shot and a cool, steady aim that terminated its career just in the nick of time.

At last a wind arose, and it became possible once more to breathe with some degree of comfort. It did not happen, however, to blow from a propitious direction, and we were obliged to anchor close in-shore, at the foot of Homa Mountain. This volcanic bluff is very rugged and picturesque in its

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majestic isolation above the surrounding plains. It displays successive scarps of ancient lava-flows, skirted at their base by gentle, cultivated slopes, which extend to the water's edge, it forms a most conspicuous landmark for many miles round, both from land or lake. (Plate facing p. 6.) The shore is fringed with blue water-lilies (*Nymphæa stellata*) and with groves of papyrus, its fans waving in the wind with indescribable grace.

Our crew kept up an animated conversation at a distance of about a hundred yards with a group of Kavirondo men and women cutting papyrus stems for making their circular huts. Mother-naked except for a few coils of bright, polished iron wire on the arms and legs, they moved sinuously in and out of the tall papyrus ; after watching them for some time I happened to look away for a moment and they had vanished completely : their black bodies blend so readily with the heavy shadows of the African landscape that they disappear with phantom swiftness, as if dissolving in the shadows of the bushes.

Bird-life is abundant on the lake : black herons with orange throats perch patiently on the thorny thickets of ambach skirting the shore, a flock of graceful black and white ibises glide swiftly through the air, a fish-eagle makes a sudden swoop upon its prey, and (most imposing of all) thirty or forty large crested Kavirondo cranes flap lazily along in heavy flight with loud, clanking cries.



HOMA MOUNTAIN SEEN FROM THE LAKE.



HOMA BAY.

SAHANGA.

The advance-breeze of a very threatening thunder-storm in the east filled our sails at last, enabling us to cross the entry to Homa Bay. This is pre-eminently a land of thunder and lightning; at any time of the day or night a storm, far surpassing in severity those of temperate climes, is liable to spring up with astonishing celerity. Homa Mountain soon lay far behind us, its cliffs and scarps tinged a rosy red in the rays of the setting sun as we scudded past the low rocky islet of Gingra, the whitened haunt of innumerable pelicans, cormorants, divers and other fish-eating birds. It was already dark when I heard the waves breaking heavily on a black rock (near the Gull Shoal, off Uyoma Point) almost under our bow. Apparently there was no herbage on this rock, only a few feet above the level of the lake, yet it resounded with the noisy calls of countless crickets, which must have been blown across from the mainland by some strong wind and marooned here to perish miserably.

At daybreak I found that we were sailing on the deep blue, clear waters of the main body of the lake, having left the brown, muddy Kavirondo Gulf by passing through the narrow Mbita Channel in the night. This passage is so inconspicuous and so completely masked by the island of Rusinga that Stanley sailed past it when he circumnavigated the Victoria Nyanza, without realising that behind the rocky gate there lay so vast an expanse as the Kavirondo Gulf. Here in the open sea

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the islands rise steeply from the lake and are evidently merely the peaks of an ancient land that has for the most part sunk below its waters. The chart shows that the 100-foot line runs nearly north and south, close to this part of the coast, whilst a depth of even 250 feet was recorded only half a mile from the shore just west of Gwasi. (See map.) On this eastern coast of the Victoria Nyanza all the islands (including Pyramid Island, or Nagoladuru, ten miles from the coast) are clearly composed of the same basaltic lava as Gwasi and its long spurs, and form the now isolated outposts of a vast volcanic plateau, built up by successive flows of lava as in the west of Scotland and the Isle of Skye. The central peak, Gwasi, rising to over 3000 feet above the lake, was still shrouded in black clouds, and the lofty, terraced cliffs of black basalt in serried columns strongly reminded me of the similar scenery of Ben More, whilst flat-topped outliers, the isolated fragments of once continuous spurs, exactly resembled "Macleod's Tables" of similar origin in the Isle of Skye. For about an hour after dawn the sun's advent was greeted by a noisy chirruping of birds from the trees and thickets of the neighbouring island of Kimabono, whilst clear and sweet above the babel rose the melodious notes of thrushes, chats and willow-wrens to counteract the melancholy mewing of the sea-gulls.

I spent the greater part of the day in skimming the surface of the water with a net of muslin in the

hope of obtaining the fresh-water jellyfish which has been found on this lake as well as on Lake Tanganyika. Unfortunately I had arrived a little too late on the scene, for this delicate organism only floats from April to October, viz. during the period of the heavy rains. However, I managed to secure and preserve a considerable variety of the microscopic plant-life and some of the little crustaceans that dart and dash about like the water-fleas of our ponds and ditches.

During the morning the little blue steam-launch belonging to the Indian trader Aladdina Bislam overtook us with two of my fellow-passengers from Europe on board. They were Doctors Nocht and Sturm, of Hamburg, well known for their researches on tropical diseases, on their way to Shirati (just to the south of British territory), in order to make experiments with regard to sleeping-sickness. There was much shouting and waving of hats, but the fussy little launch soon left us behind. Yet it was hardly out of sight before another steamboat appeared above the horizon; it was the "Nyanza" on its homeward journey after having left Karungu. Two ships in one day was more than I had seen in the Indian Ocean between Aden and Mombasa; these lonely waters are rapidly yielding to civilisation! My negro captain did not forget that he was in command of a British Government vessel, and both the steamboat and my nameless little schooner

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solemnly saluted each other by dipping their flags in proper form.

Far away to the west lay Ilemba, a low island just above the water-level, so that its trees and bushes seemed to be growing out of the water itself. On the horizon curious waterspouts seemed to be forming : there was something suspicious and mysterious, however, about these waterspouts, for instead of the clouds sending down tails and processes to meet the whirling water, as in the waterspouts I had observed near the coast of Egypt, here, on the contrary, tall, hazy columns issued out of the water, and whirled upwards in irregular wisps, now rising, now falling. It was only some days afterwards that I found out that these phenomena were not waterspouts at all, but were caused by millions upon millions of the tiny lake-fly or *Kungu*, a small gnat which spends its larval existence in the water and emerges into the perfect insect in countless hordes simultaneously, winging their flight upwards until a favourable wind drifts the whole cloud of insects ashore. The dense multitude of their numbers can be imagined by the fact that about a week later, whilst searching for fossils on the cliffs near my camp, I noticed one of these dark clouds coming up towards me with the wind. Soon a deep hum was audible, increasing rapidly in intensity until the air was vibrating with the low, diapason note of a full organ, whilst the sun was darkened by the myriad host until it

appeared as yellow as in a dense London fog of the pea-soup order.

The aspect of the lake changes with protean rapidity : at one moment a dead calm prevails, with not a ripple on the glassy waters ; suddenly a squall rushes down from the mountains and strikes the boat ; it stiffens to a gale, sweeping up long rollers, which break thunderously upon the shore, and toss the little craft like a cockle-shell. The setting sun sank a lurid red behind colossal banks of clouds, shooting out its rays in all directions, and the captain decided to drop anchor in the bay between Kiua Island and the mainland. This time the place of anchorage did not appear to be a very happy choice, for we rolled tremendously as we lay just in the fairway, and as soon as my servant Mahomed lit the hurricane-lamp my cabin was invaded by millions of the lake-gnat in the dense clouds I had mistaken for waterspouts earlier in the day. From the shore came a vociferous chorus of crickets and frogs in noisy rivalry, and on the whole the crickets won the day with an infinite variety of babel, from the burring, clicking, and buzzing of the common herd to specialists clacking like startled blackbirds, or emulating the noisy clatter and rattle of lace-machines in a factory ; throughout the whole pandemonium the aristocrats of all the crickets produced exact imitations of police-whistles. Night brings no feeling of rest and peace in this equatorial land, and

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the continual deafening din makes the ear-drums ache as if listening to competing brass bands at the Crystal Palace. The menacing hum of the endless battalions of gnats was finally too much even for my captain, who had rolled himself up in a blanket on the cabin roof, and he pulled up the anchor and left the pestilential place. During the night a land-breeze sprang up, enabling us to make Karungu, and we anchored some way out from the shore until daybreak. Soon after sunrise a little poling through the shallow, reedy waters brought our boat to the little stone pier, crowned incongruously with a common street lamp that might have come from some back street in London ; and now two months of strenuous toil lay before me.

CHAPTER II

KARUNGU AND THE SLEEPING-SICKNESS COUNTRY

EVEN before I had set foot on land a little crowd had gathered on the rude stone jetty—a couple of native police, some Indian traders in cool, white cotton garments, several naked Kavirondo natives, and finally the representative of British government appeared on the scene in the person of Hakim Ali, a Mohammedan Indian, the *karani*, or customs officer. He was kindness personified, and was always ready to assist me in every possible way during my stay in the district of Karungu, evincing many acts of friendship to me. He gave me all the necessary information about the rate of wages for carriers, labourers, provisions, etc., and frequently procured for me a plentiful supply of cents (100 to the rupee of 1s. 4d.) in exchange for paper money. He escorted me up to the Government bungalow which had been placed at my disposal—a cool, mosquito-proof house, very roomy after my cramped quarters in the ship's cabin amongst all my luggage. The only relics of the original flower-garden of this official residence, once the home of an Englishman, consisted of a papaw

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tree with green, melon-like fruits, tasting somewhat like apricots, and a grove of small limettas in full flower, filling the air with their heavy scent. It had been a considerable disappointment when Mr. Ainsworth at Kisumu told me that Karungu had been given up as a station for Europeans ; but the first Englishman who took up his quarters here died in two months of blackwater-fever ; there is no doubt that it is an exceedingly malarious place quite apart from the sleeping-sickness, which has ravaged the whole of this coast, killing thousands of the natives.

As soon as I had seen all my baggage safely installed in the bungalow, I procured a guide, Haleli, son of Uboyo, a young Kavirondo dandy with more than the usual number of wire coils on his arms and legs ; and we walked smartly across Karungu Bay to Nira Hill, about four or five miles to the eastward, so as to make a preliminary inspection of the Miocene beds which I had come so far to investigate, and to fix upon a suitable camping-place. The path lies first of all close to the swampy shore of the lake and then across wide, grassy valleys with intervening rocky spurs from the basalt plateau. The eye seeks in vain for relief : on the one hand from the glare of the lake, and on the other hand from the treeless expanse of withered grass.

Here and there the track is crossed by the huge and deeply indented footprints of a hippo-



HAUNT OF CROCODILES, ETC



NIRA HILL IN THE DISTANCE.
AMBACH SWAMP NEAR KARUNGU.

potamus, and an occasional grunt could be heard from the jungle of the neighbouring swamp, where the thick, tangled undergrowth of tall reeds (*Phragmites communis*), papyrus sedge (*Cyperus papyrus*), and ambach trees (*Æschyomene elaphroxylon*), like polled willows growing right in the water, forms an impenetrable cover for hippopotami and crocodile; whilst cormorants, kingfishers, and pelicans find this pestilential belt an ideal hunting ground. The ambach swamp, however, has a still more unenviable reputation for being the chief haunt of the tsetse fly that transmits the sleeping-sickness. (Plate facing p. 14.)

Only a few years ago the fishing-boats of the natives skimmed over the waters of the wide bay of Karungu, and its low, shelving shores were studded with fishing villages, which were recorded by the Anglo-German Boundary Commission in its map of this part of the coast-line of the Victoria Nyanza. But at the present day the waters of the bay are deserted except for the fortnightly steamboats; all the littoral villages have vanished, and their sites are only indicated by rectangular stockades of candelabra euphorbia, which once protected the huts of the natives before they were stricken down by the sleeping-sickness. With the exception of Karungu, which retains its existence on the rocky Suri promontory owing to its importance as a colony of Indian traders and as a port of call for the steamboats circumnavigating the Nyanza—all

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the Kavirondo villages now lie high up on the hill-sides, as far away as possible from the swampy shores haunted by the tsetse fly.

Just before leaving England I had seen a map at the Colonial Office showing the districts affected by the sleeping-sickness and the distribution of the two species of tsetse fly (*Glossina palpalis* and *G. morsitans*) which are known to be responsible for the disease, and I noticed that both the Bay of Karungu and the neighbouring valley of the large Kuja river were coloured an ominous red. Moreover, I had only been in my camp on Nira Hill a few days, when I received a letter from my friend Mr. C. W. Hobley, Provincial Commissioner at Nairobi, warning me to take precautions against the attacks of the tsetse fly, which he had heard was now abundant in the wide Kuja valley, but it was imperative for me to traverse this district in the course of my geological exploration.

It is only about a dozen years since the sleeping-sickness reached the shores of the Victoria Nyanza, brought thither along trade-routes from West Africa through the territories watered by the Congo and its tributaries. The natives succumbed to its ravages with appalling rapidity; the fearless navigators inhabiting the Sesse archipelago, who used to furnish the King of Uganda with his navy, were swept down like flies, and the only way in which the British Government could save the mere remnant of the former thousands was by the bold and

drastic step of removing the Sesse Islanders, as well as the entire population of the coasts, to districts inland, far removed from the lake-shore.

Even now, in spite of many years of research, there is no certain cure, although the arsenical compound atoxyl, administered in conjunction with a salt of mercury, has caused a considerable amelioration of the disease and a retarding of its invariably fatal termination; and lately a salt of antimony (sodium antimonyl tartrate) has been shown to be still more effective.

It has long been known that the trypanosome (*Trypanosoma gambiense*), the minute organism which causes the insidious torpor, occurs also in the blood of various wild animals. Koch advocated the slaughter of crocodiles as a means of checking the disease; and few would regret the disappearance of these cruel reptiles. Sportsmen have noticed that tsetse flies are fond of biting the nostrils of a dead hippopotamus as soon as it comes to the surface, an hour or two after being shot; and trypanosomes have frequently been found in the blood of various antelopes, as well as of monkeys, otters, wart-hogs, etc. Hence the complete destruction of all the wild game in the affected districts has repeatedly been advocated on the off-chance of stemming the inexorable advance of the sleeping-sickness in East Africa or of stamping it out altogether; but this procedure would be a useless and futile slaughter of beautiful creatures, for

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evidence has been steadily accumulating¹ to show that not only antelopes, but domestic animals (sheep, goats, pigs, dogs, fowls), wild birds, lizards, snakes, frogs and toads may harbour the trypanosomes of sleeping-sickness and act as carriers of the disease. Tsetse flies have even been seen biting large caterpillars, and hence may quite easily exist in districts where there are no game animals or other large vertebrates. In the face of such evidence it would clearly be a hopeless undertaking to attempt to destroy practically all animal life in areas of thousands of square miles, to say nothing of the evils which would inevitably follow such an extensive interference with the balance of nature. It has, moreover, been demonstrated that the tsetse flies on the shores of the Victoria Nyanza were still infective and capable of communicating the disease three years after the removal of the native population.

Although the advent of sleeping-sickness in the basin of the Victoria Nyanza is a comparatively recent occurrence, it is not improbable that this is not its first visit, and that, like other scourges, it worked itself out and disappeared owing to the infected creatures, man included, having gradually secured a natural immunity, just as the humped cattle of the Kavirondo have acquired immunity

¹ R. B. Woosnam, "The Question of the Relation of Game Animals to Disease in Africa" (*Journal of the East Africa and Uganda Nat. Hist. Soc.*, December, 1913).

from the analogous *nagana* disease, which is also transmitted by a tsetse fly. For there seems to be a reference to this fly-transported disease in the Bible: the 18th and 19th verses of the seventh chapter of Isaiah, in prophesying threatened scourges, read as follows:

“And it shall come to pass in that day, that the Lord shall hiss [i.e. whistle] for the fly that is in the uttermost part of the rivers of Egypt, and for the bee that is in the land of Assyria.

“And they shall come, and shall rest all of them in the desolate valleys, and in the holes of the rocks, and upon all thorns, and upon all bushes.”¹

The “uttermost part of the rivers of Egypt” can hardly mean anything else than the headwaters of the Nile, viz. the Victoria Nyanza itself, whilst by the usual law of antithesis in Hebrew poetry, the first half of the 19th verse refers to the bee and the second half to the fly. The meaning of the verse therefore is that the flies shall rest “upon all thorns, and upon all bushes,” and it is a well-known habit of the tsetse fly to rest upon the thorny ambach bushes of the lake-swamps.

A hopeful line of effecting a cure would seem to be in the first place to discover a suitable anti-toxin to be injected in the first stages of the disease, to appoint travelling doctors to stamp out by inoculation its earliest appearance in a new

¹ My attention was called to this passage by the Rev. A. Carscallen, of the Gendia Mission, near Kendu.

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area, and also to reduce so far as possible the extent of the swamps and marshes in the vicinity of towns and villages. The Germans have utilised the services of the natives in clearing considerable areas of ambach swamp along the coast of the Victoria Nyanza near Shirati, to the south of the Anglo-German frontier ; but it is evident that this is a Sisyphean task owing to the rapid and luxuriant growth of vegetation in equatorial regions wherever there is an unlimited supply of water. Since the waters of the lake have been steadily retreating for the last forty years, it is evident that the swampy fringe on the extensive shallow stretches of the coast-line is continually increasing ; the only efficient means of grappling with this difficulty would be to erect a barrage at the exit of the Nile from the Victoria Nyanza, and in this way to maintain the waters of the lake at a constant level. Daily variations in this level, especially on the south coast, are, indeed, caused by the high midday winds, to which I shall refer later on, but these fluctuations are too trivial and temporary to affect the main issue.

Probably not many years would elapse before immunity by compulsory inoculation would stamp out the disease effectively, and would render Central Africa as free from the scourge of sleeping-sickness as Panama from malaria or Bahia from yellow fever owing to drastic preventive methods.

A novel and ingenious means of fighting sleep-

ing-sickness in the island of Principe in Portuguese West Africa has recently been described in a White Paper (published April 22, 1914) on the question of native labour. The labourers carry cloths covered with glue on their backs when working in places infested with the tsetse fly, and the number of flies caught in this way in the last six months is said with meticulous accuracy to have been exactly 95,574. Dr. Da Costa reported that since the system had been used the cases of sleeping-sickness had diminished in an almost miraculous way.

To return to my journey,—I passed at rare intervals across stretches of muddy shore bordering the low, swampy coast of Karungu Bay, whither the women from neighbouring villages on the hills come a distance of several miles to fill their water-jars; and here (during subsequent visits to Karungu) I was able to collect shells of *Ampullaria*, *Paludina*, *Unio*, *Cyclas*, etc. It is necessary, however, not to become too absorbed in this occupation of gathering shells, which is not the harmless pursuit of our English seaside resorts, for a crocodile is apt to steal silently from the marshy jungle, and with a sudden swish of the powerful tail may sweep the unwary naturalist into the muddy waters, to be seized by its horrid jaws and devoured at leisure. Such was the actual fate of a native fisherman just a few days previously, at Kisumu, whilst he was wandering along the water's edge, suspecting no danger.

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The flat summit of Nira Hill, three hundred feet above the lake, was an ideal camping-ground, although somewhat too close to the huts of native homesteads clustering on each side of this basalt spur, which overlies the clays and sandstones containing the fossil bones. Here a wonderfully extensive panorama lay open to view. To the west the vast expanse of the Nyanza, an inland ocean in itself, for the opposite shore lies 160 miles distant. In the foreground of the lake the solitary island of Nagodaluru, a symmetrical and natural pyramid of basalt, stands like a lonely sentinel, about ten miles away in deep blue water of over 200 feet. To the north, the basalt plateau, dissected by deep valleys into flat-topped heights, rises higher and higher until it culminates in the central peak of Gwasi, about twenty miles away as the crow flies. The view to the east was screened by the rounded hump of Nundowat at the back of my camp; whilst to the south, across the wide alluvial plain of the Kuja river, the rugged granite peaks of the Bingu Hills form the frontier between British and German territory. These ancient rocks, crowned with tors like those of Devon and Cornwall, form the long, gnarled finger of the Mohuru promontory pointing westward into the deep blue waters of the lake.

After a still hotter tramp from Nira to my comparatively cool house at Karungu, the remainder of the day and a good part of the night were taken up in

various necessary but prosaic tasks, such as erecting the tents to see that all was in order, overhauling my baggage and dividing it up into suitable loads, testing the filter and acetylene lamp, etc., and in making arrangements for carriers to come the next morning to move my belongings to Nira Hill.

In spite of a definite promise that the men should come early, so that the march, short though it was, might be made before the great heat of the day, yet by nine o'clock only ten men had turned up out of the twenty-four I needed, and it was suggested that they should make two journeys, a proposal which, of course, I scouted, as I had no intention of losing sight of any of my baggage. The native police, who are soldiers to all intents and purposes, with a high sense of duty and discipline, act as an official pressgang on these occasions, and by a special effort the full two dozen Kavirondo were rounded up and came over the hill, chanting in their usual cheerful manner, and in less than half an hour the loads were all divided and allotted, although not without the most vociferous clamour and palaver. There is nothing the Kavirondo enjoy more than voluble and interminable discussion, and it often pays to let them have a few minutes' indulgence and then to intervene with peremptory orders, which they obey like lambs.

At last the procession started,—the tall, well-

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built men, devoid of all clothing, presenting a barbaric martial appearance with their coils of iron and brass wire on their limbs glinting in the sun, although only a couple of them carried spears. The heat by this time (10.30) was already intense, and the five-mile tramp along the lake-shore seemed interminable, to say nothing of a stiff climb at the last of nearly 300 feet to the summit of Nira Hill. The men had certainly thoroughly earned their twelve cents (about 2d.), and it is little short of amazing how easily these natives can carry heavy loads (considerably exceeding the regulation 60 lbs.) on their heads for long distances, even during the hottest hours of the day.

The tents were scarcely up and trenches dug round them when an addition to my camp turned up in the form of three men : Omenda, the so-called "tribal retainer," to act for me in interpreting from Suaheli into Kavirondo, and two native police, whose equipment consists of blue jersey and loose khaki shorts, puttees, a rifle and bandolier of cartridges and a fez. A letter brought by Omenda from the Provincial Commissioner announced that these men were placed at my service during my stay in the province, but I was requested to pay Omenda five cents ($\frac{3}{4}$ d.) a day for his rations ! This certainly did not err on the side of extravagance, and the presence of these men saved me an infinity of trouble and worry during my life in camp ; but

before entering into details of my daily existence I propose to give some account of the habits and customs of the primitive race among which I suddenly found myself, when only three weeks previously I had been living in London.

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CHAPTER III

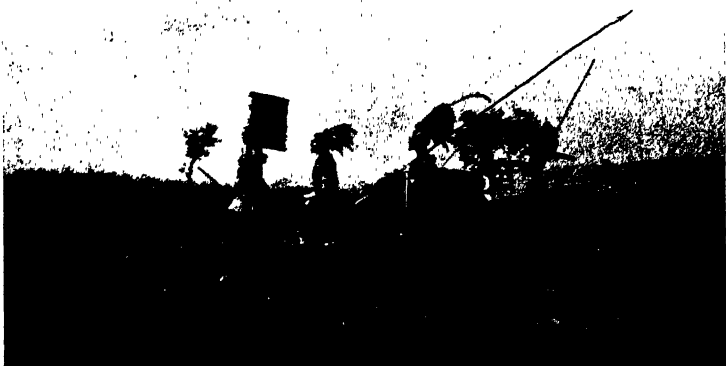
AMONG THE NAKED KAVIRONDO

DURING my solitary existence among the Kavirondo (or *Ja Lwo*, as they call themselves) of the Karungu district my surroundings were so bizarre and my mode of life so unwonted that it was sometimes difficult to believe that I was still on the same planet. During my short nights my dreams of life in England were so extraordinarily vivid that the sense of the unreality of my life in the heart of Africa was heightened. When the sun rose and I saw the fine, athletic figures of naked men, with upright bearing and easy carriage, driving their cattle up to the hills, and the equally nude tall women carrying water from the lake, I rubbed my eyes and thought to myself, "This must surely be a Garden of Eden, where men and women, young and old, all walk about naked and unashamed, untroubled by any of our conventional ideas of decency and untrammelled by dictates of fashion." They are a happy, cheerful race, living in a state of nature, and at the same time with a high standard of morality¹—in marked contrast to neighbouring tribes of negroes ; and they are steadily increasing

¹ It is almost sufficient to state that syphilis is still unknown among the Kavirondo.



KAVIRONDO ON A VISIT TO MY CAMP.



KAVIRONDO GOING TO THE DANCE.

in numbers under the security of British rule (at least in the districts free from sleeping-sickness), whilst their old enemies, the Nandi, with their lax morals, are dying out. The name they give to their race is *Ja Lwo*, evidently derived from *Ja Lowo*, a free man, and freedom in every respect is the keynote of their life and is expressed by their unfailing cheerfulness and love of song and laughter. With the exception that the tasks of water-carrying and cooking are confined to women, the sexes stand very much on an equality with regard to their daily work, and even from a physical standpoint there is not the marked difference in bodily contour in these long-limbed, narrow-hipped Kavirondo that usually obtains in most races of mankind, especially in Europe and Asia. They are a very muscular and large-boned race, showing a far superior physique to other Nilotic tribes in East Africa, e.g. the Lumbwa, Nandi, and Masai, and they probably owe this superiority to being mainly vegetarian in their diet, in contradistinction to these other tribes. Their fine physique is also maintained by the absence of any intermarriage of near relatives, for the Ja-Lwo are strictly exogamous, never marrying in the same clan. (Plates facing pp. 26 and 30.)

In striking contrast to the women of modern civilisation the Kavirondo women are much less addicted to wearing ornaments than the men; one or two coils of iron wire are sufficient for a woman, with a string of blue beads or cowries round the

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neck and another encircling the waist; but even this scanty amount of costume is usually lacking in unmarried girls. Married women, however, always wear a waistbelt in order to attach their mark of matrimony, the equivalent of our wedding ring, viz. a short tail of aloe fibre, recalling the tail worn by the primitive Egyptian hunters of the archaic period; and it would be considered a shameful thing for a married woman to be seen without her tail. On the other hand, if a young girl goes from one village to another, she often dons a tail as a means of securing the protection due to a married woman, for if anyone touches this tail or tassel he has to pay a fine of three goats to the husband of the woman. Some of the older women add to their costume by binding their brows with a fillet of cowries, probably as a sign of mourning.

Here, as in the animal world, the male is the more ornamental sex; the prevailing mode is to wear as many coils as possible of iron or brass wire on the arms and legs, and to keep them brightly burnished with oil or fat. It is a fashion that has taken so strong a hold upon the Kavirondo that it has not been found possible to stretch telegraph wires across the country except along the well-patrolled Uganda railway, for the temptation is too great for a race still belonging to the Early Iron Age, eager for any scrap of iron. The difficulty of rapid intercommunication between outlying Government stations will perhaps be successfully solved in

the near future by the use of wireless telegraphy, which would effectually circumvent the irresistible craving of the Kavirondo for armlets or anklets of telegraph wire.

No bit of iron comes amiss to the men of the Kavirondo country, and they even twist wire into the semblance of large spectacles in flattering imitation of shortsighted European travellers. (Plate facing p. 34.) These coils of wire must be in many respects detrimental to the normal development of such indispensable muscles as the biceps of the arm, quite apart from the inconvenience caused by the heat absorbed by the metal from the scorching sun. For instance, if I left a geological hammer or a chisel on the ground for even a few minutes it became too hot to handle; but, of course, the black skin is not so susceptible to heat as ours owing to the pigment. Yet sores and ulcers are frequently the result of the chafing of the skin by these coils of wire. My empty sparklet-bulbs were greatly in demand for conversion into tassels, to hang by strips of leather from the knees, so as to dangle and clank noisily against a wire-coil encircling the shins. Many a covetous glance was cast at my saucepans, knives, hammers, etc., but not a single article of any kind was stolen during the whole of my stay among these genial and honest savages.

It is, however, on the festive occasions of a tribal dance that a man puts on all his finery and becomes

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a weird and barbaric object. His numerous coils of iron and brass wire are specially polished for the occasion; a string of empty cartridges, a strip of chainmail (doubtless a valued heirloom and possibly a relic derived from some Arab warrior of the Middle Ages), anklets of bells and any odd scraps of metal are added to give a martial hint of armour, whilst split and polished hippopotamus tusks are worn (by married men only) over the ears. White or red ochre is daubed round the mouth and eyes, or is painted in white bars across the face or on the shins. Plumes made from the fur of the Guereza or Colobus monkey, or from the long hair of a wildebeest's tail, are trailed from the shoulders or are made into a sporran just like a Highlander; whilst the finishing touch is given by a nodding head-dress of ostrich plumes, radiating from an oval wicker frame. A cap or bonnet made from the mane of a lion is a most coveted possession; in default of this prize a tall busby of cocks' feathers or the fur of a monkey is worn; after all, our grenadiers and hussars do not show any great advance in respect of head-gear; but it must be unbearably hot to wear a busby of fur under the vertical rays of the equatorial sun.

On the morning of a tribal dance the countryside far and wide resounds with the doleful tooting of antelope horns, on which the octave to the primary note can be obtained by blowing extra hard. Shortly afterwards, from my high stand-



KAVIRONDO WOMEN DANCING.



KAVIRONDO RETURNING FROM THE DANCE.

point on the Nira cliffs, I could see small bands in Indian file, as if on the warpath, converging to the place of meeting; a large village in the wide plain of the Kuja river. In front a fine bull, adorned with iron cow-bells of deep and varied tone, each bell yielding two notes by the simple device of the clapper striking two tongues of iron differing in size. The bull is followed by a wife or two, carrying baskets of food (lumps of millet porridge), and then a boy (like the esquire of the Middle Ages) bearing a large oblong shield of hide, painted in red, white, and brown with serpentine devices in a kind of primitive heraldry, each village possessing a separate and distinctive design. Finally, the brave himself, glistening in red grease, armed with a long spear and decked in a head-dress of ostrich plumes and full panoply of war, the sun gleaming from his many bright and polished coils of wire, whilst his anklets of bells announced his approach from afar. (Plate facing p. 26.)

In the afternoon I went down to the plain to witness the dance, attended by Omenda and an *askari*. I was not invited inside the large village, and although I was looked at curiously and made the subject of good-humoured jokes by the women, I met with no unfriendliness, but the attitude of the villagers was one of perfect equality. I stood, therefore, as an uninvited guest, just outside the stockade of thorns and candelabra euphorbia, and whilst waiting for proceedings to commence I was

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interested in observing the lithe and graceful movements of a green whip-snake as it restlessly twined itself in and out of the dense thicket of thorns. The dance at last began with a sham but very realistic assault upon the village by the visitors. On reaching the place of assembly the warrior takes his shield from his esquire, and runs at top speed towards the stockade. As soon as he is within striking distance he hurls his long spear at the imaginary foe, and drops on the ground behind the protection of his large shield placed crosswise. With savage growls and shouts of defiance he shakes his plumed and feathered head like a terrier killing a rat, then, picking up both shield and spear, he backs cautiously for some distance, and then returns at a double to his starting-place. After a succession of these isolated rushes towards the village stockade, the whole troop of warriors thundered down in a wild, tempestuous charge, with war-whoops and shouts of "*Urra, urra, urra!*" finally hurling a shower of spears, which quivered in the ground at my feet, rather inconveniently near to me as I stood alone in front of the village. In the excitement of the moment it may conceivably have needed some self-control on the part of the younger hotheads to refrain from making a mark of the solitary white man, before whom the charge just stopped short. After all, it was in this very district that Dr. Fischer in 1886 experienced considerably hostility at the hands of the natives,

who had shortly before suffered from the ruthless attack of an Arab slave-trading expedition, and he was obliged to retrace his steps in face of the menacing attitude of the natives.

Then the men retrieved their spears and ran back to take up a position opposite to the women, who had assembled in the meantime, the older women chanting monotonously, and marking time by drumming alternately with the palms and fingers of their open hands on large tomtoms. These are hollowed tree-stems, four to five feet long, covered with lizard skin, and rest horizontally on the ground. The nudity of the women was, if anything, intensified by the profusion of blue bead necklaces (as many as twenty or thirty) with which they decked themselves. This formed their only adornment, except (in a few cases) for long black tails taken from wildebeests, whilst some daubed themselves in harlequin fashion, one half of the body a fawn colour with dark brown serpentine markings, and conversely for the other half. As a prelude to the main dance each woman picked up a calabash and a spear, and ran a short distance away; placing the spear vertically in the ground point upwards, and the calabash just in front of her, she bent forwards, shook her shoulders and breasts convulsively, and then, picking up her implements, she returned to her starting-point. Perhaps there is some obscure symbolism of fertility connected with this primitive ritual. (Plate facing p. 30.)

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After the warriors had returned from their realistic charge upon the village, the women formed up, armed with tomahawks, swords, and clubs, and now the men and women alternately advanced and retired *en masse* to the monotonous yet inspiring drumming of tomtoms and the wild, bacchantic chanting of the women. I soon wearied of the continual repetition of their massed movements and returned to camp, but their dancing seems to go on indefinitely until sunset (six o'clock), when large bonfires are lit and the night made hideous with singing and rowdy festivities, assisted by copious libations of millet-beer (*pombe*). The boisterous sounds, which drifted up on the wind at midnight as I lay on my camp-bed, trying to sleep, recalled to my mind the remarkably similar raucous sounds that emanate from Hampstead Heath or Rosher-ville Gardens on a Bank Holiday !

On the morning after one of these tribal dances I often used to meet the revellers worn out with their exertions, returning to their homes, wearily trailing their spears behind them and presenting a very limp and all-nightish appearance, so different from their brisk and jaunty demeanour of the previous day. (Plate facing p. 30.)

With regard to the origin of the Nilotic Kavirondo it can only be said that they probably reached the east coast of the Victoria Nyanza about two hundred years ago, so far as can be judged from their traditions, and that at some time previously



KAVIRONDO MINSTREL PLAYING ON THE HARP WHILST
ON THE MARCH.



KAVIRONDO MEN MAKING A ROAD.

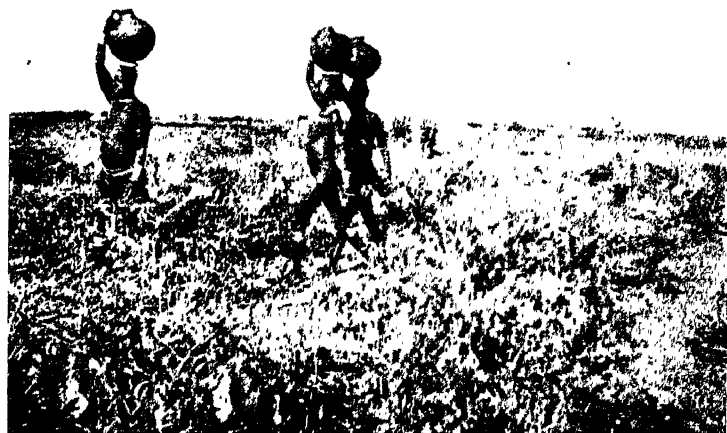
they formed part of the tribe of the Acholi, who still live on both sides of the Nile near Wadelai. They belong to the same family as the extensive Dinka tribe in the Sudan, some of whom were brought to London about fifteen years ago to take part in one of the exhibitions at Earl's Court.

Near my second camp at Kachuku I found the Kavirondo to be more primitive and backward than in other parts of their country which I traversed. These people to whom clothes are of no account are equally simple in the matter of their food, for here they cultivate neither fruit nor vegetables, excepting for a plant that is cooked like spinach. They subsist on the simplest fare, chiefly on millet (*mtama*), either in the form of a thin gruel made from the flour, or in thick, dark brown, very unappetising lumps of solid porridge that is easily carried on a journey. Cooking is reduced to its simplest rudiments; the food, however, is not eaten hot, but is allowed to cool first of all; and it is to this habit that I attribute the splendid condition of their teeth. The baking of bread is an unknown art, whilst fresh milk is disdained; it is preferred in the sour form, but it is soured by the amazing and disgusting method of adding cows' urine to it. There really seems to be no limit to the variety and ingenuity of human perversions. Needless to say, I always had fresh milk brought to me morning and evening straight from the cow in my own saucepans. Meat is only eaten by the

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Kavirondo when any member of their herds happen to die a natural death, or on the occasion of a sacrificial feast at the funeral of a chief or on the anniversary of his death. In other parts of the country, however, the men are skilled in making pitfalls for game, and it is then not without danger for a white man to wander about alone, as I often did in my geological excursions over the countryside.

A patch of tobacco plants is almost invariably an adjunct of a Kavirondo homestead, for both men and women are confirmed smokers, and one can give them no more welcome present than some tobacco and a box of matches. The headman at Kachuku—a picturesque and jovial old boy, with a battered fez flanked by hippo tusks, and a scanty and altogether inadequate leopard skin negligently slung over one shoulder—never had his pipe out of his mouth from early morning, when he proudly brought me milk in one of my saucepans from his cows, until the evening, when we bargained over the price of a sheep and he received my poorest jokes with vociferous laughter. It is no uncommon sight to see even a young girl of twelve or thirteen years of age puffing away at one of their long-stemmed pipes bound round with iron and copper wire. Along the coast of the Kavirondo Gulf, in the neighbourhood of Kendu, the pernicious habit of smoking *bhang* prevails to a considerable extent (in spite of Government prohibition), to the great



KAVIRONDO WOMEN CARRYING WATER JARS.



KAVIRONDO WOMEN FETCHING WATER FROM AWACH RIVER.

detriment of the physique and endurance of the natives. Smoking is evidently a great consolation to the sad-eyed older women, wrinkled and careworn, to whom the drudgery of carrying heavy water-jars for miles from the lake or the nearest river to their homesteads must be a severe trial of endurance. These globular jars are about two feet in diameter and are ornamented with incised markings (made with the finger-nail or a pointed stick), very similar to pottery of the Early Iron Age in Britain. The jars are not made on the spot, but come from some distance inland nearer Kisumu (so I was told), where suitable clay can be obtained, for they are made of two kinds of clay. The pot is a coarse brown earthenware externally, whilst the lining is hard, red, and polished, and impervious to water. The iron spears and hoes (*jembes*) are also manufactured inland in the same district where the iron ore is smelted; but of late the Indian traders, with commercial astuteness, have imported the iron hoe-heads, so that this native industry is in a fair way of dying out. (Plate facing p. 36.)

Near the coast the Kavirondo are much addicted to fishing, both by line and net, and I shall refer later on to their methods. The commonest catch is the grey *bulti* of the Nile (*Chromis niloticus*), which I found to be quite palatable, and the lungfish (*Protopterus annectens*) is also taken. They also eat the so-called freshwater oyster (*Ætheria elliptica*), the lower shell of which adheres closely to the

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surface of any piece of rock, often assuming contorted shapes.

On the whole, these hardy herdsmen, tending humped cattle and fat-tailed sheep, share the burden of life fairly equally with their women, with the exception of such tasks as the grinding of millet, making millet-beer, cooking or water-carrying, which, as I have already mentioned, fall exclusively on the women. The goats are tended by the children. The men, however, are not above carrying very heavy burdens of papyrus stems for building their round, grass-roofed huts, as well as tree trunks and branches for fires and fences, and they will even join the women in tilling their fields of millet with their tomahawk-like hoes. On the other hand, the husband is not invariably the dominant partner, for whilst in my tent on Nira Hill, close to a Kavirondo homestead, I was disturbed more than once by the continual nagging and scolding of a henpecked lord of creation by a black Xantippe endowed with a particularly sharp tongue. A laudable custom which obtained at Kachuku, and which might with advantage be observed more frequently in our own civilised countries, is that an expectant mother is exempted from all work or bearing of burdens.

Music, as understood by the Kavirondo, is an obsession with the race. The men are continually singing as they drive their herds up to the hills or down to the lake, caring nothing for heat that



MAN AND WOMAN HOEING TOGETHER IN THE FIELDS.

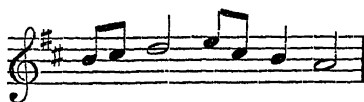


KIVIRONDO WOMEN (NOTE THE TAIL) FETCHING WATER
FROM AWACH RIVER.

is well-nigh insupportable to white men, or else strumming interminable five-finger exercises on their eight-stringed harps of lizard skin. One day the chief of the tribe came to call upon me. He was a man of considerable natural dignity, over six feet in height, imperfectly clad in a white robe, clasped over his right shoulder like a Greek chlamys, and with a weather-worn fez on his head. With his suite he brought his court minstrel. True to the cult of certain virtuosi, well known in our musical world, the minstrel had a thick shock of hair consisting, in his case, of long, thin ringlets pomaded with red grease and reaching down to his shoulders, presenting a somewhat similar appearance to the wigs of the ancient Egyptians. In addition to the customary iron and brass circlets the bard added the necessary touch of superior wisdom to his appearance by a large spectacle-frame of brass wire and by sticks in his ears. Seated on his three-legged stool and crowned with a wreath of mistletoe, the poet tuned up his harp with meticulous care—a work of supererogation, for the discordant effect was in no way remedied. Only two other members of the suite sat on three-legged stools, which they had brought with them, according to custom : a weird and truculent specimen of humanity, painted a bright scarlet on his feet, knees, and mouth, and with an ostrich feather head-dress ; and a more warlike gentleman with some ten feet of solid iron spear. The rest of the

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audience squatted on the ground or stood in a semi-circle round the performer. Then, with a far-away look in his eyes, he began to chant ecstatically, starting on a high, howling note and coming down in trips and flourishes, to the accompaniment of a simple five-finger exercise



on his lyre that sounded like a jew's-harp, and marking the tempo with a rhythmical rattling of the bells on his ankles. Now and again the chorus would join in, often repeating his chant line by line; whilst others nodded their heads in approval or else trotted round in single file, in a kind of primitive cakewalk. Even the village dogs entered into melodious competition with long-drawn howls. After a time two men came to the front, and clasping right hands they began to recite alternately in ordinary voice to the harp-obbligato of the musician. When the whole performance had come to an end I tried to find out what it was all about! It proved to be an improvised and flowery account, in the best style of the ancient bards, of their chief's visit to my camp, coupled with a laudatory account of all his virtues, together with a personal description of myself which was probably the reverse of flattering and much to my disadvantage, for the Kavirondo are a proud race with a very high opinion of themselves and possess no particle of

subservience in their character. However, I presented the musician with a handful of sparklet bulbs, which made his eyes gleam with delight, and with a mouth-organ, which he regarded somewhat disdainfully as inferior in music-producing powers to his own harp. His efforts to play it sent off his audience into wild shrieks of laughter, and the chorus dispersed in high spirits. (Plate facing p. 34.)

The chief distinguishing characteristic of Kavirondo music, or for the matter of that of negro music in general, is the strong sense of rhythm that pervades it. Of true melody according to European standards there is little or none. Whenever I was able to take down any tangible melody such as

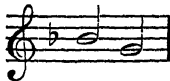


it seemed to me to contain an Oriental element and to have been probably borrowed from Indian traders. The love of the negro for rhythm is exemplified by endless repetition of monotonous tattoos on tomtoms and is deeply rooted among the natives. This insistence on rhythm is merely the reflection of the general mood of articulate nature in the environment of the Kavirondo, for on the torrid savannahs and treeless plateaux of the Victoria Nyanza song-birds are the exception and not the rule. African chats, thrushes, willow-wrens and other sweet songsters are, indeed, to be found along the banks of the rivers, which are

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nearly always thickly wooded with a great variety of trees and shrubs, for singing-birds seem to need plenty of cover.

Speaking generally, however, the ear becomes wearied with endless repetitions of the same sequence of notes, easily imitated in human words, as in the case of the bush-cuckoo, which continually assailed my ears with its querulous and resentful "Who are you? Who are you?" The long-deserted homesteads with their stockades of candleabra euphorbia, or of a more spidery euphorbia (*Euphorbia tirucalli*), which have now grown into shady groves, are the favourite haunts of a shrike that imitates to perfection the sound of a blacksmith hammering a horseshoe on his anvil, and I was frequently deceived by it during my reconnoitring tramps across country. An acceleration in the succession of notes is another maddening

variation, two notes  being repeated

over and over again, slowly at first, and then quicker and quicker, getting up speed exactly like a locomotive when leaving a railway station. Another bird closely imitates the rattle of a loose and refractory chimney-cowl, and recalled to my mind the memory of my English home by one of its minor drawbacks due to the modern jerry-builder. I even noticed a more extreme case, for the little brown clapper-lark disdains articulate expression altogether, and has recourse to a me-

chanical device for producing sound; after rising to a height of thirty or forty feet it briskly claps its wings together whilst hovering in the air, and makes a loud clattering with them in exact imitation of the old-fashioned watchman's rattle. Many other instances occurred where the call-notes of the birds in my neighbourhood consisted of the continual, rhythmical reiteration of a few definite notes, whilst at night the crickets, whose number and variety is legion in these parts, make the whole atmosphere throb with their rhythmical chirping and stridulation (as I have already had occasion to remark), and sleep was effectually murdered when a member of this noisy fraternity established himself in my tent, irritating my jaded nerves to breaking-point with a rattle like a rusty sewing-machine.

Rhythm therefore forms an essential part of the natural environment in Central Africa, and it would be surprising if it did not form the groundwork of the musical sense in the African native. The inhabitants of Kachuku simply went delirious with delight once a fortnight whenever the steamboat sounded its siren in approaching Karungu on its homeward voyage from the south. The blood-curdling wails of the siren were echoed and re-echoed, not merely from the hills, but from every lusty Kavirondo throat in every conceivable variation of the original dismal theme. The hullabaloo was tremendous, and the village dogs did their best to swell the volume of cacophony with long-drawn howls.

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The Kavirondo are fairly free from the disfiguring mutilations of most negro tribes, and do not even practise circumcision. It was only rarely that I noticed the distension of the ear-lobe for holding discs of wood (a custom practised to excess by the Kikuyu natives near Nairobi), although occasionally sticks are passed through the upper part of the ear. A young girl of Kachuku wore nothing else than three sticks in each ear and a necklace of blue glass beads! The nudity of the Kavirondo is emphasised, if anything, by their habit of laboriously removing every hair on the body, even down to the eyelashes. In this district the lower incisor teeth are not knocked out, as in the region round the Kavirondo Gulf, and scarring of the body is the exception and not the rule. Sometimes I noticed a woman with a snake pattern of weals on the right side of the abdomen, perhaps indicating some hint of serpent-worship. Isolated weals here and there on the body may be due to the practice of a husband to inflict such markings on his wife so as to ensure luck when he starts on a journey; perhaps he thinks it a good means of preventing his wife from forgetting him during his absence!

They are fond of mutilating the ears of their cattle, either by slitting them into four or five longitudinal strips, which may conceivably be useful to the beast by acting as fly-flaps in this insect-ridden country, or else they notch the ears round the margin like a cogwheel, merely as a form of

ornamentation ; yet this custom is hardly more cruel than the branding of cattle or the docking of horses' tails, still practised in our own islands.

With regard to the domestic animals of the Kavirondo, there is, in the first place, no comment to be made on the goats, for these destructive creatures seem to show very little variation all the world over. The sheep belong to the fat-tailed variety, as in Asia Minor and the Mediterranean region, and the oxen are the small African humped cattle, the gentlest beasts imaginable, showing no fear of a stranger, and sadly tormented by flies, which they willingly allow the egrets to pick from off their nozzles. (Plate facing p. 46.) It is remarkable that this form of cattle seems to have acquired an immunity against the *Nagana* disease (conveyed by the bite of a tsetse fly), which is so fatal to ordinary oxen, horses, and donkeys in East Africa. The Kavirondo are far more devoted to their cattle and even to their sheep than to their dogs. Indeed, I never saw a villager take the slightest notice of these unfortunate creatures, a kind of pariah dog, tawny in colour and closely resembling a jackal in appearance ; moreover, they do not seem able to bark like any respectable dog, but howl dismally in the most exasperating manner so long as a stranger is in sight. They never accompany their master for a walk, but stay all the time in their particular homestead. A dog is here not the friend of man ; he is only tolerated or ignored.

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There is a great uniformity about the plan and construction of the homesteads, several of which, at intervals of a hundred yards or so, constitute a village. A typical homestead is just a square enclosure, with a large, round living-hut at each corner, one for each wife, united by a palisade of candelabra-euphorbia, and with a single low entrance, which necessitates stooping, so as to place an intruder at a disadvantage. In the centre is the cattle-pen, often a mere dung-heap, fenced in roughly by branches of trees, with four or five small food-huts at intervals in the ring-fence. These contain millet (*mtama*), and are raised above the ground by wooden supports as a protection against the rats; the grain is obtained by the simple expedient of lifting off the conical roof. The head-dress of ostrich feathers, when not in use for a tribal dance, is usually suspended from a long pole in the centre of the homestead. Each living-hut is of the usual African type, the thick conical roof of thatched grass extending beyond the circular walls of wattle, which are plastered with mud and dung, so as to form a primitive, shady verandah. Inside the hut are two central fireplaces—it would be a great breach of etiquette if a stranger advanced beyond the first fireplace—and there is usually a part reserved for the goats at night. Although a native hut, if kept scrupulously clean, is a structure eminently adapted for a hot climate from the point of view of coolness during the scorching heat of the



HUMPED CATTLE OF THE KAVIRONDO.
ASAGO IN THE DISTANCE



UPPER END OF GULLY AT NIRA, LOOKING N.E.

day, and of freedom from chills at night, yet in practice there are many drawbacks. Goats, sheep, dogs and fowls are allowed to share the habitation with human beings, who never wash, but anoint themselves with grease that soon goes rancid, yielding an indescribable odour; the floor is riddled with rat-holes, and there is a plentiful population of crickets, bugs, ticks, fleas, jiggers and other undesirable companions of unwashed humanity. In such surroundings it is certainly more hygienic for the Kavirondo to be naked.

In spite of the conservatism shown by the uniformity and simplicity of their dwellings I came across an instance one day, indicating that the elements of imagination and plastic art are not wanting among the Kavirondo. Whilst clambering up and down the ravines at the foot of Nira Hill in search of fossils (Plate facing p. 46) I was delighted to find a model of a homestead in sunbaked clay, constructed by children in their leisure moments: the circular, broad-eaved huts and conical roofs, with rude figures of men and women, and an excellent representation of a sitting dog modelled with remarkable skill and vigour, although somewhat large, it is true, in comparison to the size of the huts. Yet the bold and spirited rendering of these objects in plastic clay indicates that, under suitable environment, the germ of constructiveness and imagination might be capable of considerable development.

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The religion of the Kavirondo sits very lightly upon them, and in my district, at any rate, I never observed any religious ceremonies at all, except perhaps in connection with their tribal dances. Although the sun is to some extent an object of worship, the respect for their ancestors seems to be more deeply rooted in their minds, and the fear of evil spirits and of the evil eye is very real to these simple souls. The young children are obviously frightened of a white man, and were terrified whenever I tried to photograph them ; two black cupids of three or four years howled in fright and disappeared as fast as they could toddle on seeing my camera presented at them.

Another day, when passing a filthy water-hole, where some women on the opposite bank were scooping up water in their calabashes with as little mud as possible, I came suddenly upon a boy of about seven ; in his terror he plunged wildly across the pond to seek the protection of the women and fell headlong into the mud, evoking the most uproarious and hearty laughter from the women at the discomfiture of the youngster.

The British Government wisely does not interfere in the internal affairs of the tribe except in the interests of justice, which is dispensed by the District Commissioner when making his official circuits of his province. The Government pays an annual salary to the responsible chief for him to maintain order, invests him with a much coveted



KAVIRONDO BEARERS CARRYING BOXES TO KARUNGU.



KAVIRONDO GIRLS AT KACHUKU.

robe of office and a fez with an official badge, and guarantees his people against raids from neighbouring tribes, whilst forbidding the natives to carry firearms. In return, the Government merely imposes the hut tax, amounting to three rupees (five shillings) the year, which (so I was assured) is cheerfully paid and easily collected, whilst there is no exaction of forced labour as in some parts of German East Africa. In certain districts, especially near Kisumu, the Government even supplies the Kavirondo with various kinds of seeds and encourages them to cultivate rubber, cotton, coffee and other valuable crops ; but this beneficent and far-sighted action on the part of the British administrators has not as yet penetrated to the district in which I sojourned, where the Kavirondo are more backward than elsewhere.

In many respects I was irresistibly reminded of the similarity between the British rule in Africa on the one hand and the Roman domination of Britain on the other. For instance, on Christmas Day, one of the hottest days I have ever known, with the thermometer standing at 110° F. in the shade, I marched in to Karungu with several bearers carrying boxes of fossils for the next steamboat (Plate facing p. 48) ; and I was talking to the *karani*, Hakim Ali, in his little Customs office, when I chanced to look out of the window, and a scene presented itself which, with mere modifications in detail, might conceivably have occurred in Britain eighteen hundred years

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ago. A procession was wending its way down from the hills towards Karungu: in front a native soldier proudly carrying a Union Jack waving in the breeze; then the District Commissioner, who presented quite a colourable resemblance to a Roman prefect with his pith-helmet and his bare knees below loose khaki shorts, not unlike a Roman tunic at a distance. He was followed by several soldiers (or rather native police), their rifles and bayonet sheaths gleaming in the sun, and finally the rearguard was formed by a long and motley train of bearers, some of whom carried spears. In a similar manner the Roman prefects and legates must have marched through Britain whilst carrying out their official duties, although they had the advantage of being able to ride on horseback—a very palpable advantage that is denied to Europeans in this land of the tsetse fly. It was a lucky chance that led me to meet Mr. Crampton on Christmas Day, for he was the first white man I had seen for a whole month, and we celebrated the occasion by a drink of lime juice and soda whilst seated in the cool Government bungalow of Karungu.

Although it is only a few years since the Kavirondo has become acquainted with the use of money, he is eager to acquire it and thoroughly enjoys a bargain. This was very noticeable whenever I had to requisition a sheep; for each time a somewhat higher price was asked, but as I had been officially advised not to give more than four

rupees (5s. 4d.), I flatly refused to pay the five rupees that the headman finally asked for one of his fat-tailed sheep, and threatened to send to another village for one. Eventually I told him to bring me another sheep at three rupees. This brought the negotiations to a complete deadlock for that day. I was quite unable, however, to follow the subsequent mental process of the man, for he brought the identical sheep round the next day (I could easily recognise it) and offered it to me for only two and a half rupees, whereupon I gave him the market value of three rupees (five shillings), to his evident satisfaction, and I had no further difficulty with my commissariat for the rest of my stay in his village.

In conclusion it may be said that the Kavirondo native can now lead an ideally happy existence. Relieved by the *Pax Britannica* from all anxiety of raids or hostilities, he can tend his cattle with the certainty of peace and security for the first time in the history of Africa, and there is no actual poverty. He is physiologically suited to the intensely hot climate and the scorching sun, so that he can dispense with all clothing, and he even goes bareheaded. He finds ample distraction and amusement in his tribal dances and musical efforts, whilst in return for hides (which are exported from Karungu to a considerable extent) he can obtain all the wire and beads necessary for indulging his æsthetic ideas of personal adornment. The adapta-

tion to the excessive heat of the climate is clearly a case of the survival of the fittest, for the infant mortality is enormous. The people never wash, and the grease on their hair and body goes rancid. They live at close quarters with their domestic animals, so that I could sometimes detect the proximity of a village by my outraged sense of smell long before it was even in sight. The women especially suffer from malarial sores aggravated by dirty surroundings, and they continually came to me to have them dressed, for every white man is trustingly considered to be a doctor. I was fortunately enabled to uphold this reputation by the success of my cures owing to the excellence of Parke Davis' drugs, to the exhilarating climate of the dry season and, most of all, to the iron constitutions of the natives. A young man came to me one day with the first finger of his left hand swollen up so as to be nearly three inches in diameter, and the joints were quite immovable. He told me he had been bitten by a donkey about a year previously, far away from Kachuku, where, of course, the tsetse fly does not permit a donkey to live. After two dressings with the healing Emollientine ointment both he and I were delighted to find that the long-standing swelling was reduced and that he was actually able to bend his finger again.

As in many similar cases, the nudity of the Kavirondo race is consonant with a high degree of morality. Modesty and decency in our sense of the

words simply do not exist for this unsophisticated race of Nilotic negroes ; on the other hand, there is no false modesty, and during all the weeks I camped close to their homesteads at Kachuku, where every face became familiar to me, I never saw the slightest unseemliness. As Anatole France aptly remarks : “ *La femme étant sans mystère était sans danger.* ” A young girl, innocent of any clothing, would saunter up to a youth wearing only a coil or two of iron wire, and would sit down beside him to carry on a violent flirtation, casting the most arch and coquettish glances. Yet, simply because it was the custom, both the young things were obviously as unconscious of each other's nakedness as if they had been fully dressed, and it is curious how soon one takes it all as a matter of course. It seemed quite an ordinary and everyday occurrence in this land, where Mrs. Grundy has never set foot, for a bevy of laughing damsels, free from care and clothes, to come up to my tent carrying water in their jars for my bath, and to greet me quite unconcernedly with a polite “ *Yambo, bwana.* ” The sexes are kept apart in their dwellings, the daughters of a married man living in a separate hut under the care of their grandmother or, at any rate, of an old woman.

Old maids are unknown among the Kavirondo ; for if a woman finds that she is not asked in marriage she will offer herself as a wife at a particularly low rate, so as to have the privilege of wearing the marriage-tail and thereby retaining her self-

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respect, even though she may be turned into a household drudge.

Although in temperate climates it has always been necessary to wear clothing as a protection against the cold, the habit for both sexes to bathe together in a state of nudity frequently obtained in ancient times in Europe, and even prevails at the present time in parts untainted by town life. In ancient days the tribes of Germany were renowned for their morality and chaste conduct, yet Cæsar tells us that "they all bathe promiscuously in rivers without distinction of sex and wear skins or slight coverings of deer hides, a large part of the body being nude." At the present day, so Du Chaillu informs us, in remote parts of Scandinavia the same naïve practice of the sexes bathing in common persists. The genial traveller had the rare faculty of obtaining the entire confidence of the simple, unaffected peasantry, and was treated by them as one of themselves. He tells us how on every Saturday, or Washing Day (*Lögadag* or *Lördag*), not only all the members of a family, but also their intimate friends, both men and women, old and young, run naked from the house across the snow to the barn where the vapour-bath is held. By pouring water on to heated stones an atmosphere saturated with steam is obtained, and in addition an excessive perspiration is induced by lightly flogging each other with birch twigs with no distinction of sex, finally pouring cold water on each

other. As Du Chaillu¹ remarks, "from childhood the people have gone to the bath together, and their children are brought up in the same way; innocent of guile, they no more imagine harm in what they do at the bath than if they sat down together at dinner in the customary manner; still more, the statistics show no more moral a people in Europe. After the bath the women wear high-necked dresses and are very particular in their deportment."

There is, however, no need to go beyond our own islands for a very similar instance of promiscuous bathing under somewhat primitive conditions. In South Wales there is a day in July called "Wash Day," when the peasantry and farm-servants, men and women alike, flock down to Amroth on the sea near Narberth. I am credibly informed that it is the annual custom, or, at any rate within recent years, for the women to enter the sea with nothing on but a petticoat, the men without a stitch of clothing, and the whole day is spent going in and out of the water.

A still more primitive state of things obtains in an unspoiled corner of France. In the Côte d'Or, at the village of Sémur-en-Auxois it is quite customary for intimate friends to make up a family party for a morning bathe in the river Armançon. Men and women, both young and middle-aged, undress together on the banks and enter the water without any costume whatever. *Honi soit qui mal y pense.*

¹ *The Land of the Midnight Sun*, pp. 545-9.

CHAPTER IV

HUNTING FOR FOSSIL BONES NEAR THE EQUATOR

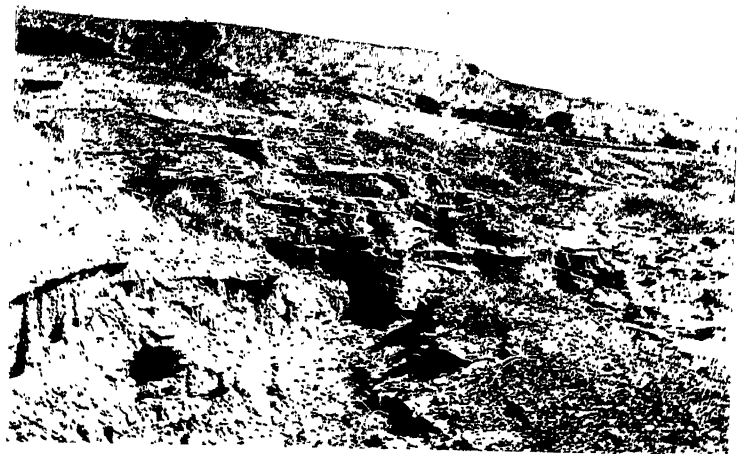
ON the Equator, where day and night are equal in duration, the shortness of the day from 6 a.m. to 6 p.m. is a distinct drawback when one is pressed for time, and every moment of daylight is precious. My day would often begin at 5.30 while it was still dark, for this was the only time when I could obtain water cool enough, viz. 65° F., for developing negatives. I soon found it was hopeless to attempt this photographic work in the evening, for even at 9 p.m. the temperature of the water never fell below 80° F., and it was only by exposing the water all night in the open that the radiation from the ground would cool it down sufficiently.

The first three hours of the day were thoroughly enjoyable, and were the most profitable for a close and minute examination of the clays and sandstones of Nira and Kachuku for fossils. By ten o'clock the heat had already become intense, and the blinding glare from the bare, sunbaked rocks was almost too great for unprotected eyes. Although I was clad as lightly as possible for my somewhat arduous task of geologising during an

equatorial summer, the excessive heat induced the most profuse perspiration, especially when hammering out fossils or even wielding a pickaxe, so that my khaki bush-shirt would be saturated in less than no time, whilst the sun's rays on the other hand were so scorching that the shirt soon became encrusted with white patches of salt. The process, though somewhat too drastic for comfort, certainly removed all rheumatic tendencies from my system in the most effectual manner. Often, as I tramped up and down the dry gullies of Nira and Kachuku (Plates facing pp. 46 and 58), backwards and forwards over bare, stony terraces, measuring each separate bed of the deposits and following its outcrop along the side of a cliff, I would feel a drop or two of water falling on the back of my hand, and on looking up in surprise at a sky of brass for any signs of a miraculous rain-cloud, I realised that it was only the perspiration dripping from the rim of my pith helmet! Under such abnormal conditions I soon found that it only led to a feeling of utter exhaustion and a thirst like blotting-paper if I waited till one o'clock for my lunch, especially after a tiring climb back to my camp on the top of Nira Hill. This drawback, however, was speedily remedied by taking with me a thermos flask of *café au lait* when I set out soon after sunrise for my daily work. In this way I might be able to continue my investigations with unabated energy all the morning after a drink of this inval-

able stimulant whilst resting under the scanty shade of an acacia bush or the equally inadequate protection of a scraggy euphorbia.

Before leaving England there seemed to be a bare possibility (judging from the very meagre information as to the occurrence of the fossils) that the bones might be found to occur in a single bed of clay, and that there might in consequence be some reasonable expectation of coming across complete skeletons of fossil animals. These hopes were soon shattered by a preliminary inspection of the ground, for the lake-deposits proved to be a varied series, about 150 feet thick, of clays, sandstones and gravels, for the most part rather changeable in character. So far from finding a bone-bed with complete skeletons, only isolated bones occurred here and there, chiefly in fragments, sometimes with a calcareous coating, and many of them must have been rolled along the bed of the ancient river before it discharged its sediments into the lake. Like all delta deposits, the individual beds often show much variation in character when traced for any distance along their outcrop; for instance, a clay may by degrees pass laterally into a sand or sandstone, or may even thin out altogether in places. Calcareous springs were evidently active at the period when the sediments were deposited, especially at first, and the travertines precipitated by such springs sometimes form continuous beds over a considerable area, and proved very useful as



CLIFF OF BASALT OVER THE MIOCENE DEPOSITS, LOOKING E.



UPPER END OF GULLY, LOOKING N.E.

SHOWING MY CAMP AND NUNDOWAT PEAK.

KACHUKU.

[To face page 58

datum-levels in classifying and measuring the whole series, or when making my detailed plans to scale of the gullies and terraces of Nira and Kachuku.

I do not intend to enter into geological details here, for I have fully dealt with them elsewhere;¹ but, broadly speaking, these Lower Miocene lacustrine strata of the Victoria Nyanza may be grouped into three chief divisions: a lower series of buff sandstones and gravels, a middle series of red clays and white sandstones, and an upper series of grey and brown clays; but the minor subdivisions were very varied. The first thing to be done was to describe and classify the beds, to measure them and to collect the fossils from each bed, following up its outcrop wherever it was exposed to view. This necessitated endless scrambling up and down gullies, pushing my way through thorny undergrowth in the narrow bed of the ravines (Plate facing p. 62), scaling cliffs in the broiling heat, and once I happened to slide down with unexpected velocity when I trusted too confidently to a treacherous branch, with the result that I could hardly limp back to camp. Naturally I had to traverse just the very places where snakes might be expected to lurk, and it was necessary to tread as warily as Agag so as to allow the reptiles plenty of time to get away. The deadly puff-adder, whose venom proves fatal in about twenty minutes, is not uncommon in this region, and

¹ *Quart. Journ. Geol. Soc.*; June, 1914.

as it is somewhat sluggish in its habits it may easily be trodden upon if due precaution is not taken to keep a good look-out. The slightest rustle in the grass, even of a harmless lizard, would set all my senses on the alert.

In forcing my way up the dry bed of a gully angry wasps often buzzed in a most threatening manner round my head whenever I inadvertently approached their nests hanging from wide, overhanging ledges of rock; two kinds were particularly noticeable: the long-waisted South African wasp (*Belonogaster*), so much dreaded for its virulent sting, which I found tending its young in elegant paper nests, or else the more handsome, black and yellow mud-wasps, who regarded me as an unwarrantable intruder on their privacy. I had to use my killing-bottle to collect their beautifully constructed nests, together with the quick-tempered and aggressive builders, before I could proceed to extract the fossil bones in their proximity without unwelcome interruption. Another day I was busy chiselling out a bone when I heard a loud humming increasing rapidly in volume. A cloud of large flies, like gadflies, was rushing up from the lake at great speed straight for me, and in order to escape their onslaught and possible attack of vicious bites I quickly threw myself flat on the ground until the menacing swarm had passed overhead.

The fossils occurred at such uncertain intervals that it seldom proved advantageous to employ

natives to dig for me excepting when some special bed seemed to be more promising than usual. Even then I found I attained better results with merely one man than when I employed several, for it was hopeless to get any idea of systematic work into their thick heads. I tried to arrange that one squad in front should use the pickaxes and that the others behind them should clear away the débris with their tomahawk-hoes (*jembes*); but a few blows with the pick was considered excuse enough for a rest and endless chatter, whilst the men with the hoes wanted to use them as pickaxes. As a matter of fact, the habit of wearing a tight coil of telegraph-wire round the biceps muscle does not conduce to its proper development or to a capacity for sustained effort. Moreover, I had to keep a sharp look-out for any traces of fossils so as to prevent them from being destroyed by a chance blow of the pick. The attention of these negroes is distracted by the slightest circumstance, and it seems impossible for them to concentrate their minds on anything for two consecutive moments. Whilst my black squad was digging one day on the side of a *nullah*, the blow of a pick suddenly disclosed a bats' nest, and out flew the dazed and dazzled white bats into the blinding sunlight, only to be immediately pounced upon and devoured by inquisitive kites, ever restlessly circling overhead. The men went stark staring mad with excitement, and the babel was deafening. Before I could inter-

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vene they had pulled out the young ones in sheer lust of destruction and thrown them up into the air for the rapacious birds to seize with unerring aim of cruel beaks and talons. The whole tragedy was over in a moment, and the excited children of nature were in such a state of jubilant ebullition at the slaughter that I had to disband them for the rest of the morning. Cruelty seems to be naturally inherent in the human race, but the Kavirondo, I think, is cruel more from thoughtlessness or a love of mischief than from malice. One day, on returning to camp, I found the villagers in a most hilarious condition and almost hysterical with uncontrolled laughter. The object of all the commotion was an unfortunate kite, which had been caught and tethered by one leg to a long piece of string. The bird was just allowed to fly about ten feet up into the air, and then was ruthlessly pulled down to the ground again by a man holding the string, who played with the wretched bird just like a cat with a mouse. They were, however, quite willing to give the bird its liberty as soon as they realised that the performance was distasteful to me, and showed no ill-humour at my intervention on behalf of their prisoner. Cruelty by thoughtlessness was manifested also by their mutilation of the ears of their cattle and by their habit of holding up the hind leg of a sheep as a means of guiding the beast in a desired direction, for the sheep very naturally pulls as hard as it can away from its tormentor.



RAVINE WHERE THE DINOTHERIUM WAS FOUND.



LOWER PART OF THE GULLY, LOOKING N E.
NUNDOWAT PEAK IN THE DISTANCE.

KACHUKU.

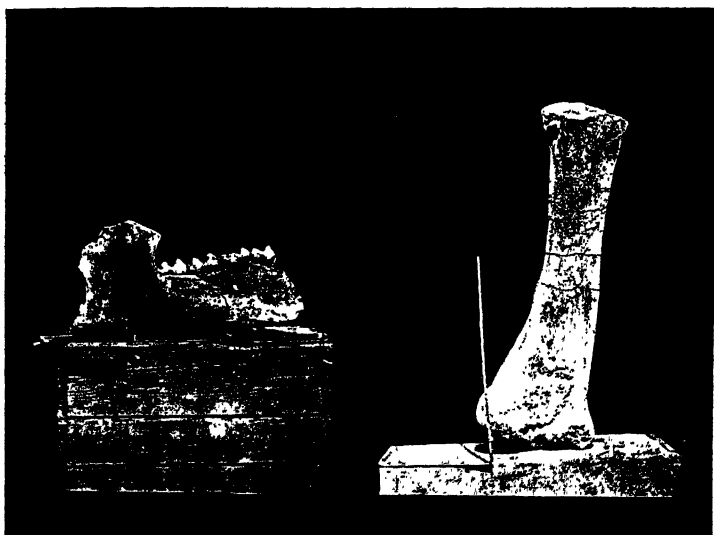
[To face page 62

It was, above all, necessary to keep to windward of the appalling atmosphere emanating from excited, perspiring, greasy blacks, who never indulge in the luxury of a bath. It is difficult to convey any adequate idea of the *bouquet de nègre* under these conditions, but a comparison to putrid onions perhaps comes nearest to the offensive reality. It is, however, only fair to state that the odour seems to be mainly due to the unwashed condition of the natives and to the rancid, greasy red ochre, with which they daub their body and coiffure of ringlets, for when a negro servant keeps himself clean and washed, and waits at table clad in a kind of white nightgown, there is really no perceptible emanation to offend delicate nostrils. Moreover, it is as well to remember that, in spite of our complacent devotion to the tub, all Europeans to a Chinaman smell like sheep! The greasing of the body is, however, a sensible custom in hot climates, for it checks excessive perspiration and wards off chills.

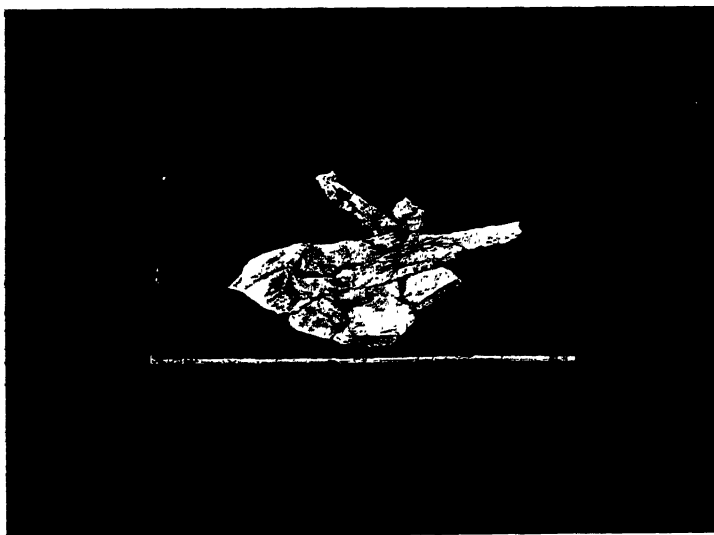
Although a certain element of drudgery was entailed by the measuring and close examination of each successive bed of clay or sandstone, yet there were rare moments, such as the discovery of a *Dinotherium* jaw-bone (Plate facing p. 64), which were ample compensation for mere routine work. Often much patient toil and care had to be exercised before a bone could be extracted from its matrix, for the sandstone in which it was embedded was excessively hard, whilst the bone it-

self was usually in a shattered and fragile condition. In such a case I had to take down my blue-flame oil-lamp and glue-pot to the particular gully where I had found the fossil, and as I laboriously chipped away the sandstone and exposed the bone I had to rub in hot glue between the splinters in the hope of being able eventually to extract it whole. My small stock of plaster of Paris (which is really more efficacious in such cases) was unfortunately soon used up. Absorbed in my task, I became oblivious to everything else except the terrific heat of the sun, when suddenly a loud, spluttering cough would make me look up with a start, only to find an inquisitive goat peering down at me over the edge of the cliff and expressing the strongest disapproval of my proceedings.

Another day, whilst engaged in chiselling away the sandstone matrix from the large shinbone of a *Dinotherium* (Plate opposite), a high-pitched shout disturbed the monotony of my work, and this time it was the bearer of a letter from Hakim Ali, the *karani* at Karungu. A more unconventional post-office official could hardly be imagined, for it was the belle of the village, who was holding the letter in a forked stick—a handsome girl of sixteen, stark naked, and with no other ornament than three sticks in the lobe of each ear! (Plate facing p. 48.) A pourboire of ten cents produced a grin displaying a set of white teeth that any chorus-girl might have envied, and as she could not pocket the coins



JAWBONE OF SHINBONE
OF
DINOTHERIUM HOBLEYI



FOSSIL GIANT TORTOISE.

[To face page 64]

she stuffed them into her cheek, just like a monkey pouching a nut.

During my exploration of the gullies a large fragment of the carapace of a giant land-tortoise was just discernible, half-way up the sandstone cliff in the lower ravine of Kachuku. To have utilised native labour for its extraction would have entailed the speedy and complete destruction of the specimen, and, whilst perched on a very precarious foothold with angry wasps buzzing round me, I had to hew away large masses of the surrounding sandstone with a pickaxe before I could approach near enough to use my hammer and chisel in extracting the fossil. Such strenuous work carried out in the heat of the day under the vertical sun of the Equator, when the temperature in the shade rose to 105° or even 110° F., proved too exhausting to be undertaken for more than short periods of time, and several attacks on successive mornings were necessary before the fossil could be completely worked out. Even then it proved to be only a fragment, like the majority of the fossils in these delta-deposits.

Apart from the *Dinotherium* gravel occurring low down in the series, one of the most interesting features of the deposits was a gravel at a higher level, only a few inches in thickness, containing many teeth, mostly of crocodiles, but also of *Dinotherium* and of a lung-fish (*Protopterus*), not known hitherto in a fossil condition, and even some fragments of jaws

of small hyracoids allied to the coney of the Bible. Freshwater shells occurred in most of the beds of the series, which I had classified for convenience of description into thirty-seven divisions; and I found these shells from No. 5 down to No. 34, below the *Dinotherium* zone (No. 31). Strangely enough, all these shells are gastropods, and are forms still characteristic of African lakes and rivers (mainly *Ampullaria*, *Lanistes* with its left-handed spiral, *Cleopatra*, etc.), and a few land-shells (*Achatina*), whilst not a single bivalve occurred, although *Anodonta*, *Cyclas* and *Ætheria*, etc., are not uncommon at the present day in the Victoria Nyanza. Probably the beds were deposited at some distance from land, and only shells which could float for a time became entombed in the sediments. Although the *Ampullaria* which I found in my No. 34 bed (i.e. almost at the base of the series) must be of Lower Miocene if not Oligocene age, yet it is identical with the *Ampullaria ovata* still living in the Nyanza, so that it is difficult to realise how many thousands and thousands of years separate us from the time of the formation of these deposits, when the forerunner of the present Kuja river brought down to the lake fluviatile deposits of sand, gravel and clay, together with occasional dismembered and rotting carcasses of *Dinotherium*, giant tortoises, soft turtles (*Trionyx*), mud tortoises (*Podocnemis*), crocodiles, and ancestral forms of rhinoceros and hippopotamus. It is, indeed, one

of the most surprising instances of the persistence of types under unchanging conditions, for all the freshwater and land-shells which I found in these Lower Miocene deposits belong exactly to the same species that occur in these Equatorial regions at the present day, although the *Dinotherium* and all the other land vertebrates have long since been extinct.

The outcrop of these bone-bearing beds is unfortunately extremely limited in extent, and we owe even this restricted occurrence to the lucky circumstance that they were secured from complete destruction and denudation by rain and river owing to the fact of their having been covered up by floods of molten lava (nepheline-basalt), and they are now only to be found at the base of the terminal cliffs of the lofty basalt plateau. Even before these volcanic eruptions took place, this series of soft clays, sandstones and gravels must have suffered extensive denudation. For instance, between the basalt cliffs of East Kachuku and Kikongo, where the deposits occur at their base, there intervenes the wide and deep valley of Kitama, which stretches far inland to the northward. If the deposits still existed here they would have infallibly been exposed to view in the bed of the main valley, nearly two miles wide at its exit into the Kuja plain, as well as in its lateral *nullahs*; but there was no trace of them—nothing but basalt, which had flowed down from the heights above into the present valley. They must have

been swept away by the destructive action of rain, river and lake long before the basalt sealed up the landscape. (Plate facing page 58.)

During my efforts to discover any other remnants of these deposits one of my first tramps was up the valley at the back of my camp at Kachuku to the top of the basalt plateau in order to see if there was any chance of discovering the fossiliferous beds on the other side of the ridge in the valley leading down to the wide Kitama valley. I had my hopes raised by finding a piece of fossil wood (from the uppermost beds of the series) embedded in the basalt near the top of the dividing ridge, for this find clearly showed that the lava-flow must have caught up this piece of fossil tree at the time when it flowed over the topmost clays. After a long and tiring climb I reached the summit of the plateau just below the peak of Nundowat, and I was soon able to look down a valley sinking steeply down to the Kitama. Here, if anywhere, I surely could not fail to meet with the beds of clay and sandstone if the lava had not completely concealed them from view, and my duty was clearly to follow the bed of this valley from its source at the edge of the plateau. The upper part was, however, a steep ravine embowered in thickets, and there was nothing for it but to plunge into the midst of the thorny scrub along the dry river-bed. I regretted for a moment that I was unarmed, without even a revolver, but the heat was always so intense that the least extra

weight soon became an insufferable burden, and I used to find that my indispensable geological hammer pulled quite heavily enough upon my belt. The stony river-bed was carved entirely out of the basalt, when suddenly it plunged steeply down a long waterslide, in which the black rock (now dry) was scoured and polished by the torrents of the wet season. This slanting rock-slide was the only possible means of reaching the foot of the vertical cliff, where I hoped to find the clays and sandstones for which I was searching. So I sat down and commenced my glissade, using my hammer as a brake. When half-way down I became aware of a spotted head and a pair of glittering eyes gazing fixedly at me from the thicket bordering the rocky river-bed at the foot of the cliff. It was a leopard ! As quick as thought I shouted at the top of my voice and hurled my hammer with all my force at the beast, who slunk stealthily away into the bushes. Needless to say, I did not waste any time looking for my hammer (I had a spare one in camp), and I left the thicket and reached the open grassy country with no undue delay, but with a feeling of chagrin at the loss of my hammer, and still more at the fruitlessness of my search for the fossiliferous beds.

The narrow outcrop of the deposits at the foot of the basalt cliffs is still more restricted by the fact that they were subsequently cloaked and covered up by a thick mantle of black earth, like the

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“cotton-soil” (*regur*) of India, so that the bone-containing deposits only appear to view in a few gullies carved out by the temporary torrents formed by the heavy downpours of the rainy season and the violent thunderstorms which occur at night at the close of the dry season. The soft clay lying between beds of sandstone and gravel is, however, so rapidly scoured by these torrents (although so transient in character) that the exposed area of these interesting beds promises to become more and more extensive every year.

In spite of the extreme heat the air had a very stimulating effect, and in the middle of the day there was always a raging, tearing wind blowing up from the lake, but it was the wind of a furnace and irritated the nerves instead of refreshing the body. However tired out I might feel on returning to camp for my lunch, I used to set out again directly afterwards with renewed energy and vigour, so as to lose none of the precious daylight; and with this object I took my tea with me (in a thermos flask thrust under my arm inside my bush-shirt) so as to avoid having to return to camp. My frugal picnic off tea and biscuits under the scanty shade of a candelabra euphorbia or a scraggy wild olive, was a proceeding of much interest to any Kavirondo women who happened to pass me on their way from the lake, carrying their heavy water-jars. Greeting me with a polite “*Yambo, bwana,*” they beamed approvingly on my returning their

salutation by the rejoinder "*Yambo sana.*" Indeed, the eagerness of the Kavirondo in this neighbourhood to be friendly with me was most marked. Whenever I passed near a village during my wanderings the headman would hasten out to meet me, heartily greeting me with the customary Suaheli "*Yambo, bwana,*" and when I replied in the Kavirondo language with the greeting they use to each other, viz. "*Waki' omera*" (Greeting, brother), he usually became effusive and insisted on shaking hands, first with the right hand and then with the left and then with the right again, after the Kavirondo fashion. I must confess to an instinctive natural repugnance to the feel of his greasy hand, but, of course, I was always careful not to wound the *amour propre* of a man who merely wished to be friendly, and I returned his grasp as heartily as it was proffered.

At sunset, after a refreshing bath and a change into loose clothes and mosquito-boots, I was ready for my evening meal. At this time one of my native police always reported himself. Correctly garbed in his scanty regimentals, with rifle and bandolier, and standing at the salute, he solemnly delivered himself of this invariable formula in bastard Suaheli: "*Bunduki mbili, kiass asherini, tumtum moja*" (Two guns, twenty cartridges, one interpreter). With equal solemnity I returned the salute, saying "*Marahaba*" (It is well). Saluting again, he turned right about face, marched off

to his tent and the little sunset ceremony was at an end. The older of the two men was not always quite sure of his Suaheli, and then I had to prompt him ! It was still more difficult to keep a straight face when I happened to be a bit late with my bath, and the representative of the *Pax Britannica* turned up, always unperturbed, when I might be in the midst of my ablutions or in a varied state of undress.

The sun by this time was rapidly sinking below the western horizon—the flaming ball of fire was gliding irresistibly into the bosom of the freshwater ocean amid a kaleidoscopic play of colour, reflected from the flaming sky to the vast expanse of water, which shimmered like mother-of-pearl. Words would be altogether futile to convey any adequate idea of the indescribable beauty of the sunsets or of the mystery and solemn grandeur of the scene. The sun preserved its power almost to the last, and even when half its sphere had sunk below the waters it was still too brilliant and dazzling to allow more than a fleeting and surreptitious glance.

Darkness then fell upon the earth in about twenty minutes, yet for a long time afterwards a tall, narrow column of pale, lambent light extended upwards from the spot where the sun had disappeared from view, just as if the Equator itself had become luminous. This mysterious zodiacal light, which is so rarely seen in our misty, northern atmo-

sphere, is more ethereal and elusive than the luminous tail of a comet, and is less perceptible to direct than to sidelong vision, whereby the image falls on that part of the retina that is more sensitive to light.

In this land of wild animals it is always advisable to get back to camp before the sun actually sets below the apparently illimitable waters of the lake; but once, when I had marched into Karungu, with men carrying three boxes of fossils (Plate facing p. 48), rather late in the afternoon so as to be sure of catching the homeward boat, the sun set soon after I had left Karungu on the return journey. The last three miles had to be tramped in Egyptian darkness, to the accompaniment of snorts and grunts of hippopotami in the ambach swamp close at hand, the dismal howls of hyenas from the hills and the booming of the breakers on the sandy beach ahead. It was impossible to see the narrow, winding path, and it was astonishing how the natives managed to keep to it. Their eyesight must be exceptionally keen, or their toes must possess a subtle instinct for any obstacles or inequalities in the path; whereas I had to keep my attention closely fixed on the scabbard of my soldier's bayonet, which occasionally glinted as it reflected the twinkling stars or the fitful gleams of fireflies. In crossing the ravines of Nira a false step would have meant a nasty fall down a rocky cliff, and I was unfeignedly

thankful when at last the light from my camp came into sight as a welcome beacon.

To a northerner the altered positions of his familiar constellations are no less striking than the zodiacal light. Here, only fifty miles south of the Equator, the Great Bear lies far down on the northern horizon ; whilst Orion, which in our latitudes stands in a nearly vertical position, lies completely on his side, and the thin sickle of the new moon rests on its back like a cradle in the sky. The clearness of the air gives an unwonted brilliancy to the stars, which seem to hang like lamps from a sky of inky blackness. Often when some unusual noise had disturbed my light slumbers and had brought me out of my tent in the middle of the night to discover the cause of the alarm, the brilliancy of the waxing moon was so remarkable that I could not resist examining its craters with my field-glasses before turning in again ; Jupiter and Venus shone like small moons, and about an hour before sunrise, whenever I got up to develop photographs, even Mercury could be clearly distinguished with the naked eye.

Before evening closed in and darkness fell upon the land I had to attend to my acetylene lamp, but the advantage of its brilliant light was somewhat discounted by the corresponding increase of its attraction to insects. It was with mixed feelings that I regarded this property of my lamp, for although I was glad to collect specimens of the

various strange insects that flocked round its light, yet it was a distinct drawback during my evening meal when in order to snatch a spoonful of soup I had to hastily skim off the flies, midges, beetles and moths, etc., which eagerly courted suicide. Constant watchfulness was necessary during the short period of my solitary supper to eliminate the winged fraternity from the tough fowl, the monotonous rice or semolina pudding, or the stewed prunes which completed the menu with very slight variation, washed down with limejuice and soda-water made with sparklets. The chief virtue of this harmless drink consisted in its being liquid, for it was never cool, and it took much boiling before I could eliminate the clayey flavour imparted by the earthenware "candles" of the filter, quite apart from the muddy bouquet of the lake-water. For this flavour the crocodiles were in great part responsible, although the connection between cause and effect may seem a little obscure. Owing to the vast numbers of these voracious reptiles lurking in the ambach swamp, which borders the great bay of Karungu, the women do not wade out to fill their large water-jars in the deeper and clearer water, but are content to scoop out a shallow basin behind the beach for the water to flow into. Here the water stagnates and festers in the broiling sunshine, becoming green and full-flavoured. It would have gladdened the heart of Captain Kotzebue, who remarked, as he threw overboard the filter which the

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great poet-naturalist Chamisso had provided for the benefit of the crew, that he was "not going to deprive his men of the nutritive particles of the water."

The Kavirondo seem, indeed, to prefer to scoop up with their calabashes the thick yellow, muddy water from water-holes where their cattle have been drinking rather than walk a mile to the lake. In spite of my precautions to drink only boiled and filtered water (continually cleaning out the filter with Condy's fluid), it was due to the lake-water that I had to be continually battling against amœboid dysentery. It would, of course, have been wiser to boil the water after filtering it instead of before. It is obviously impossible to supervise the washing up and wiping of cooking- and eating-utensils by the cook and his *toto*, or negro boy, and in this way infection can easily be imparted. As soon as I left the neighbourhood of the Nyanza and obtained river-water the distressing symptoms abated; but when I left the interior and came down again to the lake-shore at Homa Bay and Kendu the dysentery recurred in an aggravated form. With suitable treatment I was, however, able to prevent it taking such a hold of me as to interfere with my work, although I was partially incapacitated for a morning on each of the three worst attacks. On such occasions it was especially at night, when excruciating pains and cold sweat would keep me awake, that the isolation

of my position made itself felt most of all, for the nearest white man lived at Kisii, a distance of several days' journey, and I had to depend entirely on my own efforts to shake off the exhaustion and depression caused by the dysentery.¹

On this particularly dry coast of the Victoria Nyanza bananas do not flourish, and it was impossible for me to obtain this or any other fruit, and I had to depend entirely on limejuice to keep myself in as good a state of health as the climate would allow. It was only during the first few days that I was fortunately able to get a few papaws from Karungu through Hakim Ali, and this fruit, like a melon in appearance with a yellow flesh reminiscent of apricots, is of great value, since it contains a ferment, papayin, capable of digesting meat.

The interval between supper and bedtime was amply filled by writing up the notes of the day. This was no simple matter when gnats and swarms of insects of all kinds banged in my face, buzzed down my back, up my sleeves and in my hair, whilst I was trying to concentrate my attention on deciphering hastily written notes or in working out the exact succession of the beds by comparing in

¹ I managed to get the upper hand of the illness by immediately reducing my diet to nothing but boiled milk for a couple of days, administering Parke Davis' diarrhoea pills (consisting chiefly of pepsine) at first, then bismuth nitrate, and finally calomel; and then I gradually returned to my ordinary diet with the help of Sanatogen and chicken broth. Any particle of solid food, even rice or corn flour, if taken during an attack immediately brought on severe pains.

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parallel tables the strata displayed in the *nullahs* and gullies of Nira, South Nira, West Kachuku and Kachuku itself, all separated from each other by considerable intervals of space. These tabular statements had to be written and re-written several times as the days passed by, so that any difficulties of interpretation and correlation could be corrected by comparison on the ground the next day.

My nights, which were all too short to recover from the fatigues of the day, were often rendered still shorter by the irritating clamour of the crickets or by the persistent attentions of rats gnawing wood or scurrying backwards and forwards. It was one of the penalties of having to camp near a native homestead, although I kept no food whatever in my tent, and the only article that the rats attacked was the cork of a thermos flask! Each morning we had a rat hunt, into which Mahomed and his *toto* entered with great zest, shouting, "*Piga, piga*" (Strike, strike); but even when we successfully ran the rat to earth (usually in a burrow under my tin trunk) there was always a fresh tenant the next night, so that I gained nothing by my repeated reduction in the numbers of the village rats, for the new tenant was not accustomed to the numerous legs of an X-bed, and sometimes banged his head sharply against one of them in the dark when I expressed a forcible objection to his gnawing and scratching.

Another drawback of camping near a Kavirondo

homestead, and perhaps the most serious of all, was the presence of the ticks which transmit relapsing fever. Several mornings I woke up finding half a dozen of these odious insects fastened upon my skin, with their bodies swollen up to the size of small peas from sucking my blood all night, and I just had to pluck them off. The only way of guarding against their attacks (for they can crawl through the meshes of a mosquito-net) is to tie rags soaked in paraffin round the legs of the X-bed.

The prowling round my tent of the village dogs at night was quite as great a nuisance until I told the headman that if he did not shut up his dogs after dark I would shoot any of them that came near my tent; it was only necessary to emphasise this intimation by a shot the same night in the direction of an unwelcome intruder and I was troubled no further by canine attentions.

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CHAPTER V

EXCURSIONS FROM KACHUKU

Looking southward from my tent at Kachuku across the wide alluvial plain of the Kuja river, the rocky hills of Nakanero and Angaohi appeared like islands rising out of the level expanse. Even with the aid of my field-glasses it seemed to me that both these hills were composed of granite or some similar rock, but it was essential for me to examine them at close quarters in case any remnants of the bone-bearing deposits had still been preserved in some of their valleys. This was not, however, a very probable supposition, for owing to the fact that these beds have been uniformly tilted up to the northward (8° to north by west) one would naturally expect to find them at a higher and higher level the further one proceeded to the southward.

Accompanied by Omenda, an askari and a villager to carry my lunch, I set out to cross the great plain, once dotted all over with villages, which have now been nearly all wiped out by the sleeping-sickness. It proved to be a very hot and fatiguing march, in spite of the fairly level surface, and even

my bearer was overcome by the heat on our return journey and had to requisition a drink of thin *mtama*-gruel (it looks like pigwash) from the nearest village before he could proceed any further. What would I not have given for a horse or even a donkey, but no horse or donkey can live in this tsetse-ridden country !

The soil of the alluvial plain was loose and sandy, and the scraggy acacias furnished no relief from the glare as the pitiless sun mounted higher and higher in the heavens. Probably this Kuja plain was once well wooded, for here and there an old tree still remains, mostly of the sycamore fig or the weird liver-sausage tree (*Kigelia ethiopica*), which belongs to the Bignonia family and has conspicuous large, pale yellow fruits, aptly compared by the Germans to liver-sausages, hanging at the ends of long stalks. The spiny acacias, with a spreading habit somewhat like a cedar, were often thickly covered, as if with fruit, with the hanging nests of weaver-birds ; pigeons frequently perch in these trees with complete indifference to their formidable bulbous thorns, three or four inches in length ; a cricket particularly favours these acacias, and fills the air with an extremely shrill and penetrative keening that is most fatiguing to the ear. Mistletoe grew on the thorny branches in characteristic yellow-green bunches, and raised up mental pictures of Christmas festivities taking place at that very moment in England. A more complete contrast in

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my surroundings could hardly be imagined. Swallows flitted about hawking for insects ; could they be the same swallows which had left England a month before I did ? They were certainly the same species.

A huge purple grasshopper, as large as a lark, often rose with startling suddenness and after a long flight flopped clumsily into a bush, just as a flying-fish strikes the waves after its graceful glide through the air. Occasionally we put up a covey of guinea-fowl, a remarkably handsome bird in its natural haunts, and it is much to be deprecated that it should be shot down so much by sportsmen. It is, indeed, a bird that ought to receive special protection and encouragement to multiply, for it is the chief agent of destruction of the grubs of the tsetse fly. It has been known for some time that this pest to mankind is one of the few insects that do not lay eggs, but bring forth their young alive. These grubs live on the ground beneath shrubs and undergrowth, and are devoured by birds like guinea-fowl and domestic fowls, which are in the habit of scratching for food in such places.

I had traversed about a third of the distance across the plain when I heard voices coming towards me, and to my surprise and delight I saw a white man, followed by some native police, a chief in a white robe and a fez, and a long string of bearers. It was Lieutenant Rainsford, the second in command of the native police of Kisii

Boma, making a round of the Nyanza province, and he was now on his way from the district of Kadem to that of Karungu. It was with great regret and a genuine feeling of self-denial that I had to decline his cordial invitation to have breakfast with him, for it was essential for me to cross the hot sandy plain before midday, when the heat, as I knew from experience, would be overpowering.

During my tramp I came across an occasional Impalla antelope (*Æpyceros melampus*), which bounded away in great leaps into the thickets. Who could wish to kill such beautiful creatures? Certainly I never felt the least desire to slaughter these timid embodiments of graceful movement; on the contrary, it was a delight and a privilege to see them in their native haunts instead of in the prisons which we call zoological gardens. A turn in the path revealed a group of about thirty of the inquisitive banded mongoose (*Crossarchus fasciatus*) sitting up on their hind legs, cackling and grunting, to have a good look at the intruder before bolting down their burrows, and once I caught sight of a troop of the greenish-yellow grivet monkeys (*Cercopithecus æthiops*), which with equal curiosity stopped now and again to stare at me during their retreat to safer quarters. I frequently picked up porcupine quills during my tramps, but naturally I never saw the creatures, as they are essentially nocturnal in their habits.

The trees became more frequent along the muddy

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banks of the Angugu river, which, like many other tributary streams, becomes almost entirely dried up by January, with only an occasional water-hole to mark its course. Here and there small herds of the gentle humped cattle were grazing, attended by flocks of the beautiful white egret, engaged in the kindly office of picking off flies from their muzzles. Termites' nests of all sizes and shapes form the only break in the monotonously level plain of the Kuja. On putting my hand down a chimney of one of these nests, sometimes as much as fifteen feet high, I noticed that the air of the interior is perceptibly hotter than the outer air, even though this rose to 105° F. in the shade. But it was rather an unwise proceeding on my part, for snakes frequently take up their abode in these large chambered mounds. The destruction which the termites effect on the dead wood used for our houses, furniture and other adjuncts of our civilisation is more than counter-balanced by the useful function of these blind myriads of tiny insects in tilling the soil, far exceeding in magnitude the beneficent work of earthworms in our temperate latitudes. Termites, moreover, not merely aerate and turn up the soil, raising it into their high, pinnacled nests, to be washed down again and levelled by the tropical rains, but they rapidly consume every dead branch and every rotting tree, transforming useless material into fertile soil and clearing the ground for fresh vegetation to spring up. (Plate facing p. 84.)



NAKANERO HILL.



TERMITES' NEST ON KUJA PLAIN.
OMENDA IN THE FOREGROUND.

It was a welcome break in the march to come upon the river Kuja, here about thirty yards across, and to wade the swiftly flowing stream by a shallow though very stony ford. A stockade has been erected the whole width of the river and is beset with hinged, wicker fish-traps, evidently only for use when the river stands at a higher level, i.e. during the rainy season. (Plate facing p. 86.) To reach this ford I had been obliged to deviate my course considerably to the eastward, I had now to turn equally sharply to the west, along the left bank of the river, sometimes making a short cut from loop to loop of the gently meandering river, which flows about twenty feet below the level of the plain, whilst half a mile or so to the south the granite hills commenced to rise up with rugged peaks.

Nakanero itself consists of a mass of huge boulders of granitic gneiss, piled in titanic confusion one above the other, recalling the granite tors of Devon and Cornwall, but with the tropical adjunct of candelabra euphorbias and other fantastic and grotesque forms of vegetation. (Plate facing p. 84.) Here and there, on the lower slopes, a few Kavi-rondo homesteads with euphorbia stockades have managed to find a foothold, with small plantations of the castor-oil plant. From the intense curiosity evinced by the negroes it was evident that a visit from a white man is an exceptional occurrence. In physiognomy most of them possessed well-cut features, and in some cases even reminded me ludicrously of distant friends in England.

A frugal lunch under welcome shade soon revived me after my long tramp, and I handed over a good share to Omenda and the askari. Evidently this action on the part of a white man was somewhat unexpected, for their attentiveness to me afterwards was most marked.

After a rough and tiring scramble over the huge bare blocks of grey granite I reached the summit, and a fine view lay before me of the long, rugged promontory of Mohuru, pointing like a gouty finger far into the deep blue water of the lake. The drowned valley of Gurekeri Bay on the north and of Mohuru Bay on the south of the promontory indicate that this particular block of land has sunk; whilst the block of land to the north of the Kuja valley seems to have risen. A sandbank lies across the mouth of the Kuja.

To the south, as far as my glasses would reach, there was nothing but hill upon hill of bare grey granite, and it was evident that my quest in this direction for my sandstones and clays was quite fruitless, and there was nothing to be done but to return the way I had come.

Hippos were disporting themselves in the deep muddy waters of the Kuja, here bordered and shut in by a jungle of tall reeds and a thin belt of forest trees. (Plate facing p. 88.) These ungainly river-pigs were shy and never came up anywhere near the place where they had sunk, so that it was in vain that I tried to get a snapshot. High over-



LOWER KUJA RIVER.
STAKES AND FISH TRAPS. MAN STOOPING TO DRINK.



MAN DRINKING, NYAROYA.

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head a fish-eagle soared, the white head, neck and tail boldly contrasting with the jet-black body and wings, whilst a flock of majestic crested cranes rose up lazily from a grove of castor-oil shrubs.

I returned to camp across the same ford over the Kuja, but the exertion of marching across the sandy plain through the noontide heat had already aggravated the symptoms of my first attack of dysentery; and when still some miles from camp I had now and again to lie flat upon the ground from sheer exhaustion wherever there happened to be a little shade. During one of these enforced halts I found a thicket of fragrant jessamine (*Jasminum schimperi*) and a plant of the gorgeous Gloriosa lily with scarlet and yellow flowers and leaves ending in tendrils. It must surely be poisonous to be spared by the destructive and ubiquitous goats.

Just opposite my tent, in front of the granite hill of Nakanero, a small promontory called Sowsow extended into the lake, and was crowned by a grove of old trees. Here, so I was told, there was recently a populous fishing village, but sleeping-sickness came and swept away the entire population. My field-glasses seemed to reveal a slight rise in the ground on this promontory, so one afternoon I tramped across by myself on the off-chance of finding some of my deposits at this spot. After a five-mile march over the scorching plain where termites' nests, 10-20 feet high, are the only elevations, the deep shade of the tall, dark green sycamore fig trees

looked doubly alluring, and the roar of the breakers behind the high screen of papyrus sedge seemed an invitation to a sandy beach. But on approaching the once prosperous settlement signs of desolation were soon apparent: the circular huts of the natives were all in ruins, most of them completely levelled to the ground, but a few huts had been so recently tenanted that only the roof had fallen in, just like an umbrella blown inside out. No sign of any human creature was anywhere to be seen. Man had been routed and evicted by an insignificant fly; no herds of cattle, no sheep or goats. The wild geese, the crested cranes and the sooty black ibis had the place all to themselves, and raised loud cries of alarm or defiance at my invasion of their haunts. But it was impossible for me to reach the dense shade of the great trees or to find a way to the shore of the lake, now so close at hand. Each path from the open plain ended blindly in an impenetrable jungle of reeds, bamboo, papyrus and thorny ambach, from which there issued only the raucous grunt of a hippopotamus or a mysterious rustle that told of crocodiles lurking in wait for any living creature that might incautiously venture near. The ubiquitous bush-cuckoo, calling out "Who are you? Who are you?" in startlingly clear notes, seemed to be the genius of the place resenting my intrusion; on the other hand, the metallic notes of the drongo shrike so much resembled the hammering of a blacksmith on his anvil



LOWER KUJA RIVER NEAR NAKANERO.
HIPTO RISING IN MID-STREAM.

that it was difficult for me to realise the complete desertion of this spot by human beings, where so many generations had lived in former days, with no inkling of its impending fate. The silent grove was more closely guarded by its dense and thorny thickets, matted together by snake-like lianes and creepers, than the enchanted palace of the sleeping beauty, and the silence of death reigned over the place so lately resounding with human voices and human laughter.

My other tramps to the south-east of my camp at Kachuku only revealed the ancient foundation on which the Miocene beds had been deposited, viz. gneisses, crystalline schists and old eruptive rocks. A round hill called Rabur, situated in this direction, formed the objective of one of my tramps, for it was a convenient landmark for taking observations. It proved to consist of hornblende-schist, from which all the overlying Miocene beds must have long ago been swept away. Standing on its summit (a little lower than my camp at Kachuku), I was busy taking the positions of all suitable peaks with my prismatic compass, when I turned round to find at my elbow an inquisitive Kavirondo, armed with a long spear, who had left his herd of cattle and silently followed me to see what kind of magic the white man was up to. It was a little startling to find six feet of brawny black nakedness on the top of this bare hill, to say nothing of the spear, where a moment previously I could have sworn there was

no human being within a radius of at least three miles. He was frankly curious, and at first distinctly suspicious; probably he surmised that I was a rain-maker of a somewhat unusual brand. Although my stock of small talk in the Kavirondo lingo was distinctly limited, it was enough to bring a broad grin to his face; the ice was broken, and our friendship was clinched by a gift of empty sparklet-bulbs (which I always carried about with me for such eventualities). My indispensable geological hammer, as I chipped away at the rocks, excited the interest of this man of the Early Iron Age more than any other article of my belongings.

To the north of Nira and Kachuku all the valleys only revealed several feet of black earth containing recent land-shells (still showing colour-bands) and bones of living species of animals, such as antelopes, giraffes, zebras and wart-hogs, although most of these no longer inhabit this particular district. This black, alkaline soil, so similar to the cotton-soil (*regur*) of India, would doubtless be equally suitable for cotton-plantations, but hitherto no attempt has been made near Karungu to encourage the natives to grow this valuable crop. Occasionally a yellow-brown "loess," also containing land-shells and small calcareous concretions, is visible below the black earth; but even this bed is obviously of comparatively recent formation, for it overlies the basalt belonging to the Gwasi system and sometimes contains angular fragments of this

rock. It is, indeed, due to the disintegration of the basalt.

Thus the only hope of finding any further outcrops of the fossiliferous beds was to travel along the line of strike, viz. in an easterly direction, or, to be quite exact, to a point north of east, where they would crop out at the same height. It was close to this line, at Kikongo, five miles eastward of Kachuku, that I found them again, at the base of a basalt cliff, exactly as at the intervening spur of East Kachuku (just north of Rabur). Before definitely moving camp I had, however, to complete my work by mapping the district with the aid of my prismatic compass and by marking the boundaries and extent of the different kinds of rocks that appeared on the surface, by drawing out plans to scale of the gullies of Nira and Kachuku, and by taking photographs showing the characteristic beds of the deposits.

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CHAPTER VI

MARCHING INLAND TO METAMALA

WHEN (as in my case) a traveller in Africa is unable to procure porters for the whole of his journey, but has to depend on the men of the village wherever he is encamped to take his belongings to his next camp, it is practically impossible to make a really early start, and I used to consider myself lucky if I got away by seven o'clock. Unfortunately my departure from Kachuku coincided with another attack of dysentery with corresponding exhaustion and general indifference to life. I felt too ill to supervise the important business of dividing and apportioning the loads, and the wily headman (*niampara*) was not slow to take advantage of my temporary slackness; instead of complying with my orders to supply me with twenty-four strong men as bearers he only produced fifteen, and made up the deficiency with about twenty boys and girls. Of course, the loads had to be proportionately increased in number and diminished in weight. However, I countered his little scheme for enriching his village by announcing beforehand that half

loads meant half pay, a point of view which they readily saw to be reasonable.

Whilst camp was being struck a withered old woman came up to me as I sat beneath the scraggy wild olive on the hillside, and indicated that she wished to have her sores dressed. By this time I had achieved quite a good reputation in the district as a healer, thanks to an excellent medicine chest which Messrs. Parke Davis and Co. had generously lent me. Thin, overworked and with an expression of hopelessness on her sad, wrinkled face, she presented so pathetic a sight that I could not resist her mute appeal, in spite of my own feeling of lassitude and inertia. Pulling myself together, I got out my medicine-chest to dress her sores with some emollientine ointment spread on cyanide gauze—of course, I had always to be scrupulously careful to avoid any accidental contact with the purulent sores—and then I bandaged up each one. The process nearly exhausted my remaining stock of ointment, but the poor old thing would not let me pass over a single sore, and by the time I had finished bandaging her up she had more clothing on than ever before in her life. She looked sixty, yet she was probably not more than thirty, for women age so rapidly in Africa. I only regret that I did not have enough energy to photograph her. Finally, when I thought my task was over, she stood on one leg and showed me a small sore in the sole of her left foot. This nearly beat

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me, for it was obviously impossible to bandage this place, so I had recourse to a pencil of lunar caustic so as to cauterise the place. Then, to my surprise, she offered me two eggs out of a little wicker basket. It was the only instance of gratitude that I had come across in the course of my amateur doctoring among the Kavirondo: the motive was excellent and unexpected; but my first and last medical fee was not very munificent, since eggs only cost $1\frac{3}{4}$ d. a dozen. Of course, I would not accept the gift, but I showed my appreciation by giving her a cake of soap, coupled with an injunction to observe cleanliness in the future.

At last a start was made, with an unusual amount of shouting, singing and ululation; the dismal howling of the village dogs was my last impression of Kachuku, where I had spent so many weeks of unremitting toil. We followed the roughest of rough tracks to a village at the foot of the round hill of Rabur. Here my caravan had got in front of me whilst I was engaged in taking some observations, and instead of following my instructions to go straight across to Kikongo through the village of Luala, they made a long and unnecessary *détour* to the south. Probably they found an easier path, for the negro does not mind how far round he goes if only the going is easy for the feet. Whilst on the march the Kavirondo often wear thin sandals of skin, but they always seemed to me to give more trouble than they were worth, for they necessitate

frequent stopping on the part of the wearer in order to remove small stones that often get caught in between the sandal and the sole of the foot. If a stone is lying in the path he prefers to make a fresh path round the stone rather than stoop to pick it up and throw it out of the way. As a consequence the African paths are as tortuous as a corkscrew. In addition, the negro has the peculiar habit of placing one foot in front of the other, so that their footpaths are much narrower than ours. They also become worn into deep ruts during the heavy rains, with the disagreeable result that if for a single moment I took my attention off the path in order to observe landmarks or to jot down notes as I went along, I was almost sure to stumble over a thick tussock of grass or to kick my ankles—minor but very real sources of irritation in the intense heat.

By ten o'clock the sun was hammering its rays down upon me with relentless force as I tramped across the sloping plain at the foot of the basalt cliffs, and now and again I was forced to lie flat on the ground from sheer exhaustion owing to the grip of the dysentery, in order to revive sufficiently to tackle the next hundred yards. Even with these enforced delays my short cut brought me out into the open sunbaked plain of dead grass well in advance of my caravan, and now my goal was in sight. Pointing out the clump of trees where I wanted them to pitch my camp, I sent them on in

advance, and struggled on slowly in their train across the wide Kitama valley and then up an interminably long slope to Kikongo, which is situated at the foot of another lofty basalt cliff.

This dry valley of Kitama extends far away to the north into the heart of the basalt plateau, but its smooth slopes of basalt revealed no traces of the deposits for which I was anxiously searching. At last I reached the grove of candelabra euphorbias, where I thought of camping, but instead of finding my tent ready for me nothing had been done, and quite an unexpected difficulty presented itself. The square enclosure was very old, for these uncouth, spectral trees, once merely a low palisade surrounding a Kavirondo homestead, now reached a height of twenty to thirty feet, yielding a most welcome shade; but when I indicated the exact place in the grove where I wished my tent to be pitched, Omenda hastily made the objection that it would be dangerous for me to camp within the enclosure owing to the numerous snakes which it harboured. To this transparently false statement I rejoined that I had hardly seen a snake during the whole of my stay in this part of the country and that there were obviously none in this spot, where the grass was short and scanty. Then he shifted his ground and suggested that I should certainly be troubled by rats. On my brushing this excuse aside, he finally gave the real reason, viz. that a great chief had been buried here. Of course,

I immediately gave way, admitting the force of his objection and respecting the scruples of the natives, whose religion merely consists of a mild and shadowy form of ancestor-worship, coupled with propitiatory sacrifices to the sun, whilst only the chiefs are supposed to enjoy a future existence. So I asked Omenda, who was obviously relieved in mind at my decision, to show me what in his opinion was the most suitable place for my tent. It was eventually pitched just within the entrance leading to the sacred grove, but still in the shade of the weird and uncanny trees.

My stay at Kikongo synchronised with a slight change in the weather, the country being covered with a morning haze, which obscured the distant landscape and made photography impossible. It was, in fact, a kind of sea-fog that drifted up from the lake. Kikongo, however, is situated in an ideal position, open to every breeze, and the air at this height (3924 feet), although only 200 feet above the lake, was so invigorating that after my midday meal of boiled milk I had nearly recovered from my attack of dysentery and regained enough energy to be able to set out to investigate and measure the deposits, which extended half-way up the cliff, and then to take compass observations from the actual summit (Nagwena, 4173 feet) to all conspicuous landmarks. The lower and more productive beds of the Miocene deposits had already showed signs of thinning out at the base of the somewhat similar

basalt cliff of East Kachuku; and in the short, shallow gullies of Kikongo the lowest bed was only No. 20 out of the thirty-seven beds I had observed at Nira. The red clays of the middle series had nearly all passed into grey clays; fossils were few and far between, and were mostly confined to some fragments of bones of turtle and crocodile and a few land-shells. On the other hand, the uppermost bed of grey clay contained many pieces of fossil wood, that had been petrified by the agency of calcareous springs so as to preserve the most minute microscopic structure. Some of these fossil tree-stems could be identified as allied to existing African types such as the cotton tree (*Bombax*), which reaches such imposing proportions; whilst in our latitudes the only representatives of the same family are our humble mallows.

On the day before I left Kikongo for further exploration one of the villagers brought to me his boy, about seven or eight years old, both equally naked. The boy was obviously very ill, but timid and scared to death of the white man, like all young Kavirondo children. He was in a state of high fever, with a very quick and irregular pulse and a hard, hacking cough—in fact, he was clearly suffering from pneumonia. So I rubbed his chest and back with capsolin as hard as I could for about a quarter of an hour, gave him a tablet of phenacetin and caffenin to allay the fever, and told the father to take him back to his hut and wrap him up in a

sheepskin so as to get him into a profuse perspiration, and to keep him there until he was cooler. I never expected to see the boy again, but to my surprise he was brought round to me the next morning by his father, who was all smiles. Nature, with the little aid I was able to give, had worked wonders, for the boy's pulse was normal, his skin was cool and, in fact, he had recovered from the fever as well as from his fear of the white man.

From the high standpoint of Kikongo I reconnoitred in all directions in search of any continuation of the deposits, wishing all the time that I had a horse to cover the ground quickly and without fatigue, but my search was all in vain. To the south, however, I only found the foundation of ancient crystalline rocks, concealed for the most part by the weathered ironstone-rubble called *Murram*. In this direction some deserted villages are still enclosed by ramparts composed of this murram, which binds together into a hard, solid rock, much better for defensive purposes than a wall of loose stones. The landscape consists either of thin acacia forest or of open grassy valleys between gentle hills; the orange ironstone soil cloaks hill and valley alike, and it was only rarely that I came across a quartz reef on a hill-top or a small crag of ancient volcanic rock.

To the northward my search was equally baffled during my tramps up the wide and deep valleys

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which dissect the extensive basalt plateau, for the floods of molten rock have completely overwhelmed and concealed the soft clays and sandstones. Even the extensive denudation which has carved out these abnormally wide valleys, waterless in the dry season, has not been able to cut through the thick covering of tough volcanic rock.

I saw that my only chance of coming across another remnant of the Miocene beds lay in my proceeding still further east from Kikongo along their line of strike. But for some days I was doomed to disappointment. After leaving Kikongo I descended the long, sandy slope of ironstone, past several ruined villages, and then I skirted the base of two more low spurs of basalt and passed along the swampy springs of the Indua river, which flows to the southward and is bordered by dense thickets of tall *Cyperus* sedge. Here the soil consisted, again, of the black cotton-soil derived from the weathering of the basalt.

Then I ascended a long slope of basalt, up the face of the spur through a thin wood of spindly, thorny acacias—the air throbbing with the shrill keening of crickets—to a bare, rather dreary upland with aloes and wild asparagus. Even my Kavi-rondo bearers, usually so cheerful, seemed to be depressed by the desolation of the landscape, and one or two of the more musical members of the troop tried to keep up their spirits by tooting on antelope horns, occasionally varying the monoton-

ous iteration by blowing a little extra hard and getting the octave to the note.

On reaching the summit I found myself in a district of volcanic rocks much older than the basalt and offering much greater resistance to atmospheric weathering; angular blocks of this augite-andesite were frequent, and the thick black earth now gave place to a thin, barren soil of reddish clay. I looked in vain for any deep valleys or gullies in these ancient volcanic rocks, much older than the stratified beds for which I was searching. Before me the twin peaks of Nyakuru rose steeply from the undulating plateau; whilst to the north the tall cliffs of Kodondo framed in the wide valley. I had intended to follow this wide valley to the north of Nyakuru, where I had hoped to find a village and a suitable camping ground; but fate decreed otherwise, for Omenda came up and informed me that we should have to go round to the south, that there were no villages in the country to the north of Nyakuru, and consequently it would be quite impossible to obtain bearers for the next stage of my journey. In fact, he said that this district was wild and deserted—not a human being to be seen, nothing but the ruined stone walls of deserted villages, for the sleeping-sickness had stretched its grim shadow across the land and had swept away the entire population. Omenda graphically described the illness by resting his head on his hand and saying, “*La-la-la.*” All the tracks had disappeared

in the tall, dense grass, and the country had been given back to the unquestioned dominion of wild animals. I had, indeed, already noticed some traces of lions, and it was the fear which these animals inspired in my bearers that (as I afterwards discovered) was the chief reason for my enforced détour to the south-east, along a valley between Nyakuru and Laja, crowned by the ruined walls of a deserted village. This valley led me down towards the Kuja river, and soon a roaring became audible, not of lions, but of the Gogo Falls at the foot of a lofty grey bluff of volcanic rock. The ford, however, lay about half a mile above the falls—in fact, all the fords by which I crossed the Kuja were situated above falls or rapids—and I marvelled how my bearers managed to negotiate the sharp stones and swift current of the swirling, muddy river, reaching nearly to the waist, for it was quite difficult enough for me to keep my own footing without carrying a heavy burden on my head.

During a short halt on the left bank for my midday meal under the shade of a sausage tree (*Kigelia ethiopica*)—the Kavirondo call it *yago*—Mahomed produced a tin of tongue which was obviously unfit for human consumption, for the tin was inflated, and there was quite a loud report when I stabbed it with my tin-opener. I told Mahomed to throw it away, but I noticed afterwards some of my bearers eating the tongue with apparent relish and without ill-effects—at least,

none of them died that day, whatever may have happened to them afterwards. When one remembers how negroes enjoy eating the entrails of animals, and even regard such repellent items as titbits, this immunity to ptomaine poisoning is not quite so surprising as it would seem to be at first sight. A much stranger phenomenon was the assembling of scores of butterflies—small blues and sulphur-yellow *Terias*—on the opened tin to imbibe with avidity the putrescent grease. It is, of course, well known to collectors that some butterflies are readily attracted by offensive matter—an ancient stoat is often used in the New Forest as a bait for a Purple Emperor to tempt him from the tree tops down to the ground; and the largest assemblage of butterflies I ever saw was in Turkish Armenia, on a camping ground of a caravan of camels, where hundreds of black-veined whites were drinking from offensive pools of liquid manure.

The village Moroya lay on the crest above the ford, not far from the site of a sleeping-sickness camp (now abandoned). The conical hills of Odera and Kamarenga, to the west and east of the Kuja valley, stand like sentinels guarding the entrance to the district of Kaniamkago. Here Omenda suggested that I should camp, but as it was only half-past one I objected, and then he was for taking me due east, I was already too far away from my projected route, so I called a palaver with the headman of the village, a comparatively young

man, with a fez on his head and a leopard skin slung negligently over his right shoulder, in order to ascertain if there were really no villages to the north, for I no longer trusted Omenda's positive statements. Thereupon everyone crowded round me and tried to talk all at once with the air of possessing exclusive information on the point. Waving them aside and shouting "*Ling, ling*" (Kavirondo for "silence"), I cleared off the gesticulating, noisy mob, and eventually I elicited from the headman that there really was a village with good water and plenty of men at no great distance to the north. After a couple of hours' march over a level plain of ironstone with quartz fragments, and then up and down grassy ridges of andesitic lava without a sign of human habitations, I was nearly giving up all hope of ever finding a village; but at last we entered upon a wide, open plain, and finally I camped at Metamala on its western border, whence extensive views were obtainable in every direction. Picturesque piles of rugged grey crags rise up in several groups behind the village and recall the tors of Dartmoor; they consist of a much harder rock than the old volcanic ashes of the surrounding country. (Plate opposite.) Here, in fact, I found myself upon the neck or blocked-up chimney of a very ancient volcano, which had once spread devastation in distant ages far and wide over the country. This volcanic agglomerate has quite the



METAMALA CRAGS : VOLCANIC AGGLOMERATE.



METAMALA CRAGS.

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appearance of a pudding-stone: it is full of rounded blocks (sometimes as much as a yard across) of partly melted rocks, mostly of grey granite, lying in a paste of dark green volcanic ash. A curious circumstance about this rock of the Metamala crags is that the weathered surface shows no difference of hardness between the included fragments of granite, andesite and jasper and the enveloping matrix—to use a homely simile, the rock presents exactly the appearance of a currant dumpling cut by a sharp knife. Both matrix and fragments have been so thoroughly saturated with silica that this volcanic pudding-stone or agglomerate behaves like a rock of uniform composition.

The fine airy situation of Metamala and the attentiveness of its headman in promptly satisfying all my demands for wood, water, milk and fowls, etc., were somewhat counterbalanced by such drawbacks as a superabundance of insect life, the howling of hyenas and the roaring of lions at night. It was the most ant-ridden place I ever struck, and there must have been more ants in the space of any ten cubic feet than human beings in the whole world. Even the ground after a shower of rain had the sickly smell of rotted insects, exactly like that of butterflies which have been left too long in a relaxing-tin. Before turning in I had to get Mahomed to remove the ground-sheet of my tent owing to the concerted opposition of myriads of

small brown ants. By some mysterious means of communication their objection to the ground-sheet took the form of continued rhythmical buzzing against it, with only an occasional pause in the proceedings of protest. When the obstacle to their freedom of action had been removed the ants were forgiving enough to keep quiet for the rest of the night.

The white ants or termites made themselves unpleasant in quite another fashion. Every box had to be placed on large stones to be out of the way of their depredations, but their activity and voracity can be gauged by the fact that in clearing the table for my evening meal I happened to drop on the grass a book with a cloth binding. In the course of only an hour the termites had plastered their runs of earth against the binding and had even begun to burrow into it ! But it was during my first evening meal at Metamala that I experienced the most objectionable form of insect persecution. Suddenly my nostrils were assailed by a most penetrating odour, which I could only compare to a very dead dog in the last stage of putrescence, and it was impossible to proceed with my frugal repast. I promptly summoned Mahomed the ever ready to see if he could throw any light upon the matter, and we opened all the chop-boxes in case a dead rat had been locked up by mistake ; but just as we were giving up the quest as hopeless, Mahomed gave a leap and a yell, and the mystery was solved.

The author of the appalling odour was a black, solitary stink-ant, an inch in length, with powerful jaws, which he had buried into Mahomed's little toe. During my three days at Metamala he brought me quite a number of these offensive insects, held gingerly at arm's length in a cleft stick, to be promptly immolated and preserved in methylated spirit.

Here, too, I found it more difficult than anywhere else to do any writing at night, for, in addition to the usual throng of insects buzzing round my head, the big, blundering, winged forms of the driver ants (*Eciton*), as large as hornets, were attracted in great numbers to my lamp and banged into my face and tumbled about on the table in the most clumsy and irritating fashion.

The usual nocturnal chorus of vociferous crickets received an unwelcome addition in the howls of hyenas and the roaring of lions, coming nearer and nearer to my tent as the night grew on. Fortunately for us the lions were not man-eaters. Metamala lies as an outpost on the edge of the extensive district rendered derelict by the scourge of the sleeping-sickness; and hence the hyenas were particularly numerous owing to their having battered on the thousands of victims of the disease. Usually with a reputation for cowardice, these animals were here particularly bold, not merely carrying off sheep and children from the village, but even attacking adults if out at night. A native, whilst

asleep in an unprotected camp, had had his nose bitten off by a hyena, and another had a piece taken out of his leg. Thomson, in his adventurous journey through Masailand, mentions a similar instance where the hyenas had adopted aggressive habits, e.g. at Ndasas, where they were excessively voracious, dragging children out of the huts and killing people at night.

I had only been asleep an hour or two when a terrific thunderstorm broke just overhead, and the deluge of rain effectually extinguished our large camp fires. Suddenly, at two o'clock in the morning, I woke up with a start to hear the ghoulis howls of hyenas just outside my open tent, and one beast was even stumbling over the tent-ropes in his attempts to enter the tent to get at me. Hastily pulling on my mosquito boots, and snatching up my electric torch in one hand and my Mauser pistol in the other, I rushed out and fired a few shots in the direction of the howls and the shadowy forms. It was, however, impossible to see in the inky darkness of the night, and the reports only served to scare off the hyenas until my men lit up the camp fires again. I also relit my acetylene lamp and barricaded the entrance to my tent with my chair and table, so that I was able to fall asleep in security to the soothing accompaniment of lions roaring close at hand, punctuated by the yowling of the hyenas in retreat to their lairs. Curiously enough these sounds recalled a night of my early

childhood, when I lived not far from the Zoological Gardens and listened to the lions and hyenas after the explosion of the gunpowder barges on the Regent's Canal in 1874, speculating in childish terror as to the possibility of the wild animals breaking loose.

CHAPTER VII

THROUGH THE SLEEPING-SICKNESS COUNTRY

THE bright sunshine of the following day quickly dispelled the memory of the night disturbed by the ghoulish hyenas, and my first task was to turn my steps westwards again so as to reconnoitre the ground to the north of Nyakuru, where I hoped against hope that I might yet find some outcrop of the deposits. A steady climb up a gentle grassy slope with thin evergreen scrub brought me to the summit of the rounded hill of Godateli (4383 feet), a little over a hundred feet above Metamala. The crest is formed of a wide vein of white quartz (running in a N.N.W. to S.S.E. direction), rising out of the surrounding tuffs of the ancient andesites, yielding an orange-brown and highly ferruginous soil. The occurrence was quite similar to the quartz vein rising out of old eruptive rock at Nyaweta, south of Kikongo.

From this point of vantage the view was most extensive, and I was beginning to take a round of compass readings when I discovered to my chagrin that I had left my field-glasses behind, so I tore a page out of my notebook and wrote a message to

Mahomed, sending it by my bearer back to my tent post-haste. Sooner than I expected my black Mercury came running up the hill with a camp-stool in his hand. Then it suddenly dawned upon me that Mahomed could not read ; so I had to resort to a picture letter, showing first of all an outline sketch of the field-glasses, then the case hanging up on the tent pole, then a somewhat crude sketch of the bearer running with the case in his hand, and finally a diagram rather than a portrait of myself holding the glasses up to my eyes. This graphic message was quite a success, in spite of the crudeness of my hieroglyphs, and soon brought up Mahomed himself with the glasses, accompanied by Omenda. I had by this time finished my compass and aneroid readings as well as a panoramic sketch of the landscape ; and with Omenda's help I was able now to indicate to my bearer exactly where I wanted to go and to find out the nearest ford across the river Kuja.

My bearer, carrying a box with my lunch and camera, etc., led the way down to the Nyaroya ford, first of all crossing the wide Olasi valley, consisting of rich and fertile pasture land, but now no longer inhabited. The Olasi river at this time of year has its course marked out merely by a string of isolated water-holes, about twenty feet wide, with reedy margins, but beautified by water-lilies of a celestial blue (*Nymphaea stellata*) (Frontispiece) and the glossy leaves of the tropical duckweed or water-lettuce

(*Pistia stratiotes*); the curious carnivorous water-plant *Utricularia Thönnigii* is frequent; whilst bright red dragon-flies restlessly hawked about for flies over the still and placid waters. I only wished I could have had time to botanise in this attractive spot, but I had to push on with all speed in order to get far enough west before having to turn back so as to get into camp before sunset.

On a hill overlooking the ford across the Kuja there still remain the high stone walls of the deserted and ruined village of Nyaroya. The loose stones are remarkably well fitted together, reminding me of the mysterious ruins of Mashonaland, and were perhaps built by the original inhabitants of this country before they were dispossessed by the Kavirondo, who migrated hither from the Nile region about two hundred years ago. None of the Kavirondo villages which I saw in the rest of the Nyanza province showed any such walls excepting Maraga on the opposite side of the Metamala plain, and a few of the ruined villages to the west of Nyaroya. They prefer now to make their palisades of a hedge of candelabra euphorbias.

The dense vegetation and lofty forest trees which clothe the banks of the Kuja are a welcome change to the burnt-up grass and scraggy acacias of the surrounding country; but I had to push on rapidly westwards, proceeding in a bee-line by compass, for there was no path. It was stiff going to push my way through tall grass shoulder high and at the

same time to scramble over angular boulders. Numbers of hartebeest or *topi* (*Damaliscus jimela*)—*tané* in the Kavirondo tongue—with long, solemn faces, shambled off clumsily when I came within fifty yards and then turned round for a good stare at the intruder; impalla (*ogōnde* in Kavirondo) were less frequent and less bold. On this side of the Kuja I found myself again in the region of spiny acacias, tall and ungainly, giving a very depressing appearance in comparison with the smiling landscape and green bushes of Metamala.

In order to cover the ground which I had been prevented from traversing the previous day my course lay, first of all, over a broad, low hill occupying the centre of a wide plain to the north of the twin peaks of Nyakuru. After a short halt for lunch on the summit, within the ruins of the deserted village of Yangoma, all overgrown with scrub and thorns—a fine resort for snakes—I descended the steep and rocky western side of the hill and crossed a wide valley with a grey clay soil, perhaps an indication that the Miocene clays once overlay the old eruptive rock at this spot, and have subsequently been washed away. Finally, I ascended the western break-off of a range of hills called Kodondo bounding the valley plain on the north.

From this lofty standpoint (4182 feet) I looked westwards across a wide, open plain rising gently up to the summit of the basalt spurs of Kikongo.

114 THE SLEEPING-SICKNESS COUNTRY

Thus I was able to bridge over the gap which my enforced *détour* to the south-east of Kikongo had necessitated. The day was now so far advanced that I had reluctantly to turn back, for it would not have been prudent in this region, where lions were obviously numerous, to risk marching after sunset without even a path to keep to.

Although it was evident that the whole of the region north of the Kuja was completely occupied by the ancient lava, it was necessary for me to utilise another day in traversing the district still further north, so as to make quite sure that no fragment of the Miocene deposits remained to the north of the line of strike produced eastwards from Kachuku; and the result quite justified the additional delay.

On my return to camp by a slightly different route, but crossing the same ford at Nyaroya, I found Omenda and the two soldiers much agitated and perturbed at my having marched into the lion country without an escort, and they seemed to be genuinely relieved to see me again. When I set out the next day for my reconnaissance one of the askaris insisted on coming with me. This time my course lay several miles to the northward of my route of the previous day. Leaving the crags of Metamala behind me, I descended to the wide, grassy plain of the Ogo river, devoid of paths and, indeed, of all traces of human habitation, although the ruins of villages still exist on the higher ground.



OGO FORD OVER KUJA RIVER, LOOKING UPSTREAM.



OGO FORD OVER KUJA RIVER, LOOKING DOWNSTREAM.

Topi and *impalla* were again abundant in the luxuriant natural pastures, and it was a delight to see the graceful leaps and bounds of the latter, in striking contrast to the loping and shambling gait of the ungainly *topi*. The Kavirondo do not seem to hunt these antelopes, although the headman of Metamala begged me to shoot some *topi* for him and his men; but I had no time to spare on a purely hunting expedition, even if I had had the inclination.

The glare and heat of marching across the open, treeless plains of tall grass soon became excessive as the sun grew in power, and it was a great relief to come down again to the well-wooded banks of the Kuja river. Here at last, close to the ford below the confluence of the Ogo river with the Kuja (Plate facing p. 114), I discovered the last remnant of the Miocene deposits. They form a narrow belt along the left bank of the Kuja, and face the river in a low cliff about fifteen feet high. Although a careful search revealed no sign of a fossil, the similarity of these grey and brown clays to those of the uppermost beds of Kikongo and Kachuku, and still more the fact that they had been tilted up at exactly the same angle and direction, viz. 8° N. by W., convinced me that they formed the easternmost continuation of the bone-bearing beds. Moreover, they occurred precisely on the line of strike of these beds, as produced from Kachuku, and at the same altitude. On this day I only made a cursory examina-

tion of the strata, for I was anxious to proceed as far as possible to the westward, even further than the previous day. But I went carefully along the river-bank on the following afternoon.

Whilst fording the river I noticed that a dyke of the old andesitic lava extended like a weir half-way across the river-bed. Just below the ford the river makes a great bend to the west, due to the obstructive influence of these hard old volcanic rocks. Proceeding along the right bank over the wide alluvial plain, I perceived many indications of lions—not only their footprints, but their unmistakably rank smell—especially just where the river turns south again through a gap in the rocky barrier. The vegetation along the banks was here a very dense jungle, in sharp contrast to the steep, rocky face of a high cliff up which we scrambled to the ruins of Minyere. (Plate opposite.) This lofty and picturesque situation commanded a most extensive view of the hilly landscape in every direction, and I seized the opportunity of making a panoramic sketch during a very necessary halt after the exhausting climb in the intense heat.

From this spot I proceeded by compass again as nearly due west as the extreme roughness of the ground would allow. It was indeed some time before I could extricate myself from the sea of angular boulders and tall grass in which I had landed rather rashly owing to my desire to cut across country in as direct a line as possible; yet



KUJA RIVER AT MINYERE, WHERE THE LIONS COME TO DRINK

there was never a murmur from either my askari or my bearer. The sharp, scorching rocks, thorny scrub and broken ground tried my own patience sorely enough, well shod as I was, but it must have been distinctly more trying for African negroes with bare feet, who always take the easiest paths they can find, regardless of the increased distance. Then for a time we passed through a belt of old gnarled, thorny trees, covered with lichen and giving the appearance of a much neglected orchard ; and eventually I came down into a wide valley running S.W. and N.E. at the base of Undatu, a conspicuous mountain with a crest-line like a lion couchant. Here at last I was able to walk briskly along the fairly level surface, free from stones, and I kept to this valley for some distance to the N.W. until I could turn the long spur on the opposite side of the valley. Then I marched due west again until I came to a solitary and scraggy wild olive, one of the few trees to be found in this country of grassy steppes and bare hills. Here I lunched in its scanty shade, and, following my usual custom, I passed on to my soldier and bearer the remains of my modest tiffin, as well as a cigarette each, which was much more to the point. In spite of explicit instructions, they never carried any food for themselves, but they are apparently accustomed to march all day long without a bite of anything. It was evident that they fully appreciated my action, for they not only followed me over the roughest

ground without a grumble, but they never lost an opportunity of showing me some spontaneous attention on their part. Later on in the afternoon I was crossing the swift and muddy Kuja by a very stony ford when I nearly lost my balance by stepping into an unsuspected hole; my bearer quickly turned back and handed me his spear. By its help I safely reached the other bank of the river, and I had just sat down to wipe my muddy feet on the grass, when up rushed my soldier with a pannikin of water for me to wash them before pulling on my boots and stockings.

After I had finished my coffee I gathered some very large bulbs of a *Crinum*, which were growing between the roots of the tree, and then skirted the spur of andesite along the southern margin of a wide, open, grassy steppe—part of the Utangi plain. Pushing on past the melancholy ruins of Nonnia (another silent witness of the annihilation wrought by the sleeping-sickness) I reached the basalt plateau of Kikongo, thus effecting a junction with my reconnaissance from that place.

From this standpoint I could see with even greater distinctness than on the previous day (for I was nearly two miles further north) that there was no chance of finding or expecting any outcrop of the clays and sandstones in this vast stretch of smooth, gentle slopes of basalt, unbroken by any gully or watercourse. Despondent with my want of success, I reluctantly turned back, marching



FORD OVER KUJA AT NYAROVA.
NAVIRINDO WOMAN ON THE MARCH

along a still more northerly line so as to examine the hills on the north side of the plain, but they were composed of the same volcanic andesite. Finally, after a most fatiguing struggle through rough tussocks of tall wiry grass, I made my way back again to the wide valley of Undatu, down to the Nyaroya ford. (Plate facing p. 118.) Just before reaching the river I halted at a small Kavirondo homestead—the last outpost of humanity in this tsetse-stricken district—where my men got a drink of thin *mtama* gruel in the usual yellow calabashes (the hollowed stalk of the bisected calabash acts both as spout and handle). Here I noticed the only instance of paternal affection I had seen among the Kavirondo, for the owner of the homestead was dandling a year-old infant in his arms with obvious tenderness and care whilst chatting with my men. It was unfortunately already too late and overcast for me to record this domestic picture by a snapshot, and I had to push on with all speed in order to reach Metamala by sunset before the lions and hyenas began to prowl round the village.

Returning past the massive ruins of Nyaroya, we kept for a long time to the south side of the wide Olasi valley, at a considerable height above the river-bed, passing over a terrace of coarse gravel. This consisted of well-rounded pebbles of quartzite, which (as I afterwards discovered) must have been brought down by the Kuja from the quartzite of the Kisii Highlands, at a time when the river flowed at a level about a hundred feet

above its present bed. It is, indeed, possible that this zone of gravel marks an old beach-line of the Victoria Nyanza, for similar gravels and even caves occur on the western coast, in the district of Buddu at the same height, viz. 300 feet above the present level; and the terraces at Kikongo (with pebbles of pink gneiss brought from a distance), and those of Nira and Kachuku probably belong to the same period. It was on the terraces of the last-named localities that I discovered some stone implements (scrapers) fashioned from obsidian (which must have been brought from the Rift valley, about 150 miles distant), as well as from quartzite and quartz-porphyry; and on the terrace at Nyaroya I found a similar stone implement of quartzite. The natives knew nothing of these implements or of the people who fashioned them, but they belong to the usual East African type, and may perhaps be referred to the period when Bushmen were the prevalent race in the African continent.

Tired and hungry, I reached hyena-haunted Metamala just as the sun set below the western hills, and the air was heavy with the fragrant perfume of the white-flowered acacia. Before reaching camp I passed an unfortunate madwoman, who chattered incessantly to us with much insane laughter until out of earshot. It was a remarkable contrast to the usual taciturnity of the hardworked sex.

The following morning I spent in completing my map so far as I had gone, and in incorporating the

observations of my toilsome reconnaissances. In the afternoon I set out by myself for a tramp down the wide Ogo valley to examine in detail the ancient clays and shales of the left bank of the Kuja which I had noticed the previous day. The river-banks are so densely wooded that it was only by a few gaps that I could penetrate, just at places where the wild animals come down to drink. I had nearly reached the river through one of these gaps when suddenly a huge lizard scuttled noisily up the bank almost from under my feet and disappeared in the reedy jungle. For a moment I thought it was a small crocodile, for it was about seven or eight feet long, but it was a large Nile monitor (*Varanus niloticus*), somewhat like an iguana in appearance, without any aggressive tendencies. Its presence seemed, however, to imply that crocodiles must exist in the neighbourhood (although I was assured to the contrary), for the staple food of these huge lizards consists of crocodiles' eggs.

Close to the same spot, on the shady banks of the Kuja, I collected the fruiting fronds of a liverwort, hoping that it might be a new species, but it turns out to be identical with the common liverwort (*Marchantia polymorpha*) of our own islands. It is, at any rate, a remarkable circumstance that this delicate plant should be able to adapt itself with equal ease to our cold and frosty climate and to the intense heat of the Equatorial region.

CHAPTER VIII

METAMALA TO THE KISII HIGHLANDS

As a set-off to the annoyances from insects and hyenas the headman of Metamala was most assiduous in his attentions and prompt in complying with all my requisitions; in fact, he was almost too friendly. It was, however, a pleasing contrast to find that he displayed none of the grasping greed of the headmen of Nira and Kachuku, and when I left his village to cross the granite heights of Gongogongo he insisted on accompanying me for several miles, finally presenting me with some fowls, for which, strange to say, he refused all payment.

It was a steady climb up to the granite obelisk of Gongogongo, and here I entered upon a different zone of vegetation, characterised by the fire tree (*Erythrina tomentosa*) (Plate opposite), called *orembe* by the Kavirondo, a thorny, spreading tree, with gnarled and twisted branches, corky bark, trefoil leaves and brilliant scarlet flowers. It was curious to find individuals of this tree in all stages at the same season;—some were leafless, others were clad in foliage, and others again were aflame with vivid spikes of flowers. Leaf-fall in the tropics is not so



THE FIRE-TREE (*ERYTHRINA TOMENTOSA*) IN BLOOM

much the phenomenon of a special period of the year as the result of an excretion of waste products, and seems to be dependent more upon the age of the tree than upon a change of season. Thus the common india-rubber plant (*Ficus elastica*), so well known as a long-suffering indoor plant for suburban villas, may keep its leaves on as long as seven years in its native haunts, and then all of a sudden they will clatter down, leaving the branches gaunt and bare, and the tree then clothes itself afresh with a new garment of green.

A minor annoyance of the march, but a very painful one, was due to the *Stipa* grass (so characteristic of steppe countries), through which my path lay between the Ogo river and its tributary the Dodo. The sharp seeds stuck in my knees and worked their way through the cloth to penetrate the skin like needles. Picturesque crags of the volcanic agglomerate of Metamala still rose out of the herbage, here and there, near the villages of Dodo and Taygoreh, not far from the rugged obelisk of Gongogongo (Plate facing p. 124), and even appeared at intervals capping the wooded, rounded hills to my right. As we ascended, trees increased in numbers to form a thin forest on the lower slopes of the range of Gongogongo. Here I left my caravan to make a *détour* up to the gaunt obelisk of granitic gneiss, clambering over huge boulders. Many of these blocks, lying round the base of this natural monument, are quite thirty feet high; the smooth,

rounded, brown surface affords no foothold for plants. Omenda scrambled up with me until I could find a good place for a photograph ; but, contrary to my expectations, I was unable to scale the obelisk itself or to climb high enough to obtain a full view of the surrounding country for the purpose of a round of compass readings, in spite of the fact that the crag is so conspicuous from afar. (Plate facing p. 126.)

In my haste to catch up my caravan I descended the steep hillside rather precipitately by a narrow track and tripped over a fallen tree. Suddenly I crashed down right on the top of a mangy hyena, curled up sound asleep in his warm and foetid lair. Now at last my turn had come, and I had my revenge for my sleep being disturbed by hyenas on the previous nights, for the startled beast jumped up as if he had been shot, and bolted like lightning. Indeed, he was already out of sight in the thin forest of acacias by the time I had scrambled to my feet to get a snapshot. It was days before I could get rid of the sickening smell of the odious creature. Continuing our descent at a more leisurely pace into the deep valley, Omenda pointed out to me several more lairs of these ghoulish and repulsive animals, which he called *biss*, probably merely the Kavirondo manner of pronouncing the Suaheli term *fisi*.

During my reconnoitring tramps from Metamala I had often speculated as to whereabouts the hyenas hid themselves by day, and it was now



GONGOGONGO OBELISK OF GRANITE, SEEN FROM THE SOUTH-WEST.

evident that at dawn they retreat from their nightly forays to their secluded lairs on the rocky slopes of Gongogongo. Tracts recently cleared by forest fires showed that the opposite side of the valley consisted equally of great granite blocks. Patches of the ironstone *murram* often occur close to the path, and on breaking some of them with my hammer I found more than once that its honey-combed texture was occupied by little brown ants for their nests. It occurred to me that the ants might possibly be largely responsible for the formation of this porous iron ore by rendering the ground more permeable for the circulation of ferruginous surface-water.

When I had nearly reached the sedgy bottom of the valley it widened out suddenly, owing to the fact of the rock changing from gneiss to a dark green hornblende rock (a zoisite-amphibolite), which weathers somewhat more easily. The valley also deepens with equal rapidity, and the lofty mass of Mbala (4566 feet) came into view on my left hand. Leaving the main valley (affording a vista of the numerous fantastic cones of Ruri), and crossing two small tributary valleys (waterless at the time), we made a still deeper descent to the wooded valley of the swiftly flowing Sarri river. Here the carriers broke into their usual wild hullabaloo at the prospect of a drink of good water, their chants recalling in many respects the raucous street-cries of London costermongers. The man who had been

tooting at intervals on his ox-horn now put it to one of its primitive uses as a drinking-horn. The rank and file, however, followed their usual custom of scooping up water in the hollow of the palm and jerking drops into the mouth. Even before a Kavi-rondo quenches his thirst in this somewhat unsatisfying manner, he scrubs his teeth with a handful of river sand and thoroughly rinses out his mouth—quite an unexpectedly hygienic proceeding in a race that never washes.

Crossing a hill-ridge cloaked with red earth from decomposed rock, I passed between the villages of Mbasa on the left and Tranen on the right, when the wide dry valley of Sakwa opened to view. It contains numerous homesteads, and Omenda was extremely anxious for me to camp here, probably because he had friends in the place, assuring me that there was plenty of good water to be had, although it was certainly not in evidence, whilst he was positive that there were no villages at all on the further side of the ridge. I decided, however, to push on and see for myself how the land lay, for I was no longer able to trust Omenda as an unprejudiced guide. Sure enough, as soon as I reached the summit of the ridge (called Gomerro), there the Kuja lay in silvery curves far below me at the very base of the long mountain slope, forming the southern boundary of the vast open plain of Kamagambo, with villages dotted about everywhere. In reply to my pointing out to Omenda this unmistak-



GONGOGONGO OBELISK OF GRANITE, SEEN FROM THE NORTHEAST.
THE HAUNT OF HYENAS.

able evidence of a numerous population, my wily interpreter blandly feigned the utmost astonishment; but I was no longer deceived, for, of course, he knew every inch of the Kavirondo country. Lunching under the welcome shade of a euphorbia just below the crest of the Gomerro ridge, the whole country to the north lay open to view; as I looked about for a suitable camping-ground I noticed a village perched on a bluff overlooking the Kuja, which seemed to offer exceptional advantages of position. There was no direct path to the village, so after giving orders for the men to take the easier course by a path leading straight to the river and then down the left bank I made a bee-line for the village, through thick grass or across the even more troublesome stubble and dead stalks of a cropped *mtama* field. One has to cultivate an exaggerated heather-step in order to avoid being tripped up in the entanglement of the long, tough millet stalks lying in all directions. At last I ascended the slope to the village, but not a soul was to be seen, and on all sides the most melancholy picture of dirt and neglect presented itself. On reaching the edge of the cliff the view was certainly magnificent, the river meandering in broad sweeps round the base of the cliff about fifty feet high, but the place seemed deserted and there was an unnatural silence; the homestead was festering in dirt and filth beyond description, whilst clouds of flies hovered overhead. There could, of course,

be no question of pitching a camp in such offensive surroundings, but before shaking the dust off my feet we called out to a group of men huddled together about fifty yards down the slope. For some time they took no notice of our peremptory shouting. Finally a couple of tottering men shambled up, and it was obvious, from their listlessness and apathy, their emaciated frames, their lustreless eyes and swollen glands, that they had fallen victims to sleeping-sickness. Not a woman or child was to be seen—a marked contrast to the normal conditions of an African village. I could, alas, do nothing for the poor wretches, for I had no drugs to alleviate their misery, so we lost no time in turning our backs on the plague-stricken spot, but not before the tsetse flies had succeeded in biting me behind the ears, causing intense local irritation for four or five days. It was not until two months after my return to England that I could be sure that I was not infected.

About two miles higher up the river I espied a tent looking remarkably like my own; and so it proved to be, for my soldiers had taken matters into their own hands and had set it upon a spot they considered suitable, close to a new bridge over the Kuja. Doubtless they had ascertained from the natives the unsuitability of the camping-ground I had selected.

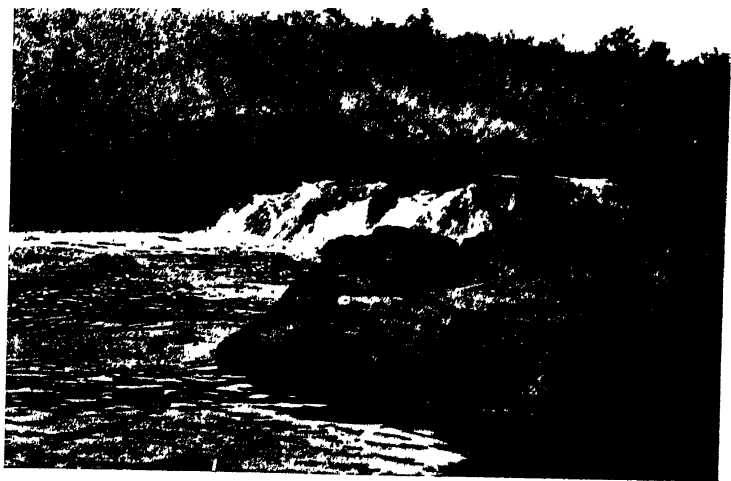
Here the contrast between the landscapes of the north and south banks of the Kuja is very striking.

To the south there rise up long ridges of hornblende rocks (amphibolites), forming a belt in front of the still loftier range of Gongogongo; whilst to the north a smooth and nearly level plateau extends for many miles—a so-called “*penepplain*”—levelled at a time when the Kuja flowed at a higher level, some 300 feet above its present winding course. The antiquity of the old plain of gneiss is shown by the considerable depth to which the hard rock has weathered into yellow and greenish white sandy clays. The large meanders which the Kuja has cut deep down through the gneiss are relics of the time when the river wandered lazily backwards and forwards over what was then the lower part of its course, and patches of river gravel still occur on the old plateau to show where the river once flowed. As I have already stated, the Victoria Nyanza at that period must have stood about 300 feet higher than at present, as shown by the high-level gravels I found west of Metamala, by the rounded contours of the landscape below the 4000-foot level, and the rugged character of the peaks and ridges above this height, and by the gravels and caves that occur at the same height on the west coast of the lake.

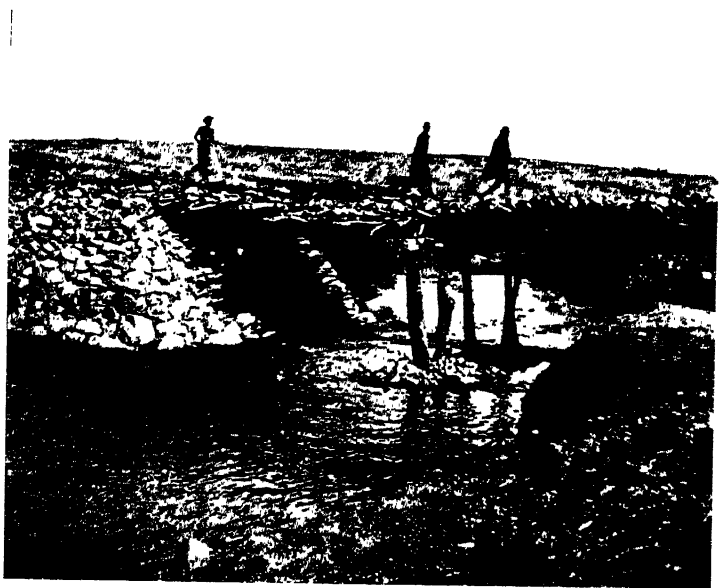
At the present the “*penepplain*” of Kamagambo is dissected by the tributaries of the Kuja into fairly deep valleys, but its character of a once unbroken plain is still quite evident. The rapids and waterfalls of the Kuja point to the fact that the rejuvenation of the river by a lowering of the lake-

level took place at no distant date, geologically speaking, and is still in progress. About a quarter of a mile below the Sakwa bridge there are some tumultuous and picturesque waterfalls, and in the deep pools at their foot I was able at last to indulge in the luxury of a swim without any risk of being gobbled up by crocodiles, with only the minor chance of having my toes pinched by freshwater crabs; and as I lay in the foaming current a remark of Robert Louis Stevenson's came to my mind that "To wash in one of God's rivers in the open air seems to me a sort of cheerful solemnity or semi-pagan act of worship." (Plate opposite.)

In Uganda and British East Africa, where there is unfortunately no coal, it is to be hoped that the water-power of the numerous waterfalls of the rivers may soon be utilised by our engineers for generating electricity, and for electrifying at least a part of the Uganda Railway instead of continuing to cut down the forests for fuel, a process which cannot last indefinitely. The Ripon Falls, where the Nile leaves the Victoria Nyanza, would alone supply an immense amount of electricity; whilst the Athi and other rivers could be dammed up at convenient intervals so as to yield a continuous current to the railway, quite apart from the advantages of the reservoirs for purposes of irrigation. I understand, however, that coal from Natal will soon be utilised for the engines for the stretch of railway between Mombasa and Nairobi.



WATERFALLS OF THE KUJA RIVER BELOW THE SAKWA BRIDGE.



SAKWA BRIDGE OVER THE KUJA RIVER.

At this spot I crossed the Kuja by a new timber bridge recently built by native labour. It is covered by fascines and stamped earth. Although the wood is of a kind immune to the attacks of white ants, it seems a pity that the British administration should not build a permanent memorial of its rule in the form of a stone bridge (as the Romans used to do throughout their empire from Britain to Armenia), especially in a district where suitable stone is abundant and labour is cheap. (Plate facing p. 130.)

In this region the Kavirondo have reached greater proficiency in agriculture than their brethren near the lake, for they cultivate a dwarf bean as well as sesame (for oil), and in one village on the plateau I noticed pumpkins. The villages, too, are much cleaner, and the central dung heap was absent, e.g. at Dodo. Being greatly in need of fresh vegetables I got Mahomed to cook me a dish of the dwarf beans, but they were very insipid and stringy.

I had intended to follow the course of the Kuja, but the negro always likes the easiest path, and so for the sake of my caravan I had to make a *détour* over the plateau. I left the Kavirondo district just before coming to Ketch, which is situated at the foot of the great cliffs of old sandstone—framing in the landscape to the east like a colossal rampart, and rising over a thousand feet above the wide, rolling plain of gneiss. (Plate facing p. 130.) About a mile before I reached Ketch the path divided into

three equally well-trodden tracks, and since we were a long way ahead of my caravan Omenda left an indication of the path we had chosen by the simple and effective device of placing a bunch of grass across the wrong paths—a device which is also adopted by the Masai, who shut off roads by placing green twigs across the pathway.

During our halt at Ketch, Omenda dilated on the great advantages it possessed compared to Vinyo as a suitable camping-ground; but, as usual, he did not give the real reason for his reluctance, viz. the dislike of the Kavirondo to enter the country of their old enemies the Kisii. It was left for me to find out by my own experience that the Kisii people are no less hostile to the British than to the Kavirondo.

At Karungu, and even as far east as Metamala, the millet had been harvested more than two months before; but at Ketch the grain was only just being dried in the sun on sheepskins and winnowed by throwing it up in the air from baskets and letting the wind blow the chaff away. I now turned southwards down a steep-sided valley which is the continuation of a wooded ravine in the escarpment. Here, however, it cuts through a softer rock, a dolerite, which borders the high quartzite cliffs like a selva. After crossing this nearly dry valley I soon came again to the Kuja itself and forded the swiftly flowing stream. The view up the river is very



KUJA RIVER BELOW THE GORGE THROUGH THE VINYO ESCARPMENT,
WHICH IS SEEN IN THE BACKGROUND
THE TREES CONSIST OF THE FIRE-TREE AND THE UMBRELLA ACACIA.



RAPIDS OF THE KUJA RIVER (TAKEN FROM MIDSTREAM) JUST BELOW
THE GORGE THROUGH THE VINYO ESCARPMENT.
THE TREES ARE THE FIRE-TREE AND THE UMBRELLA ACACIA.

beautiful, as it comes hurrying out of its gorge over many pebbly rapids. Its valley is bordered on both sides by grassy park land dotted with many trees, chiefly the fragrant white acacia (with spreading crown like a cedar) and the scarlet fire tree. (Plate facing p. 132.) Here the valley widens out owing to the presence of soft schists, weathering very readily; further downstream they are said to contain veins of auriferous quartz, for the working of which a company was, I believe, formed some time ago called the Kaniamkago Syndicate, but the insufficient yield of gold led to the early abandonment of the scheme. Unfortunately the very limited time at my disposal did not allow of my visiting the spot.

It was a long and tiring climb across several steep-sided spurs up to Vinyo, situated half-way up the escarpment at a height of 5266 feet. My camp lay on a terrace which was probably an ancient river-terrace, but I could not find any gravel to justify this surmise. The view was very extensive over the country I had traversed, but to my great disappointment the landscape was much obscured by the smoke of the hillside fires of the natives, who adopt this convenient but wasteful method of clearing the ground for their crops. By nine o'clock in the morning it was already too murky to distinguish detail, and even the outlines of the giant mass of Gwasi, only forty miles away, were dim and un-

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certain. Hence all essential observations in the form of compass readings or panoramic sketches had to be made as early as possible in the morning. Yet the atmospheric conditions at the very best were vastly inferior (owing to the humidity of the air) to my experience in the highlands of Armenia, where I could actually draw details of mountains from a distance of 120 miles.

CHAPTER IX

THE KISII HIGHLANDS

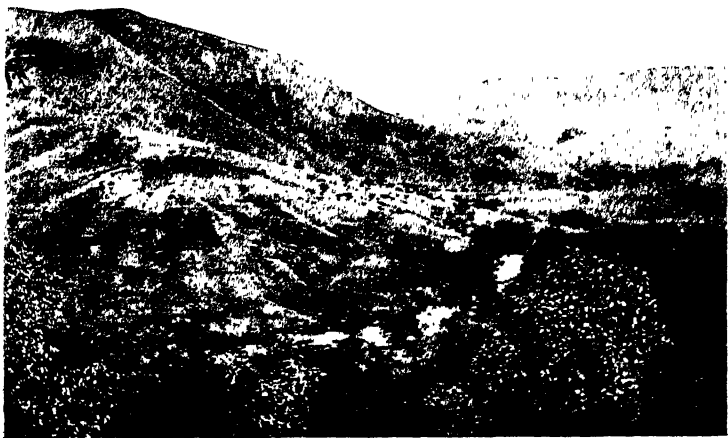
VINYO is a considerable assemblage of scattered homesteads, straggling over rather a wider district than usual owing to the formation of the ground, for they are restricted to a rather narrow terrace half-way up the escarpment. Their position is, indeed, closely dependent on the geological nature of the ground, which is here of somewhat a remarkable nature. (Plate facing p. 136.) Between the schists at the foot and the barren and stony quartzites of the summit of the plateau an enormous mass of igneous rock insinuated itself in a sill or layer of considerable thickness, extending over a very large area. This intrusive rock has hardened and altered the overlying sandstones, converting them into tough quartzites, stained purple in places with hematite. At the actual junction of the two rocks the grey sandstone has been turned into snow-white quartz, forming a conspicuous band of colour in the hill-side, and even the igneous rock itself has been modified, for it is saturated with quartz and contains numerous round steam-cavities, now filled

with quartz and chalcedony. This dolerite weathers much more easily than the hard quartzite and yields a very fertile red soil, forming not only an outer selvage to the quartzite highlands, but also composes the bed of the deep gorge of the Kuja. Its greater fertility has been the determining factor in causing the native settlements to be congregated along the outcrop of the igneous rock. No doubt these ancient sandstones (similar to the Waterberg series of the Transvaal and probably of Devonian age) once extended far beyond their present limits, but it is doubtless due to the greater hardness conferred upon them by the intrusive rock that has enabled them in this area to withstand denudation and to remain to this day as the lofty Kisii Highlands.

The Kisii negroes are quite a different race from the Kavirondo, with a softer, Bantu language and slighter physique. Yet they have the reputation of being ferocious and warlike; and a military expedition had to be sent five or six years ago to overawe them owing to the murder of a trader. Only shortly before my visit two surveyors were asked to go through their country in order to map the limits of the sleeping-sickness region (which I had just traversed), and they flatly refused to risk it. I was quite unaware at the time of the bad reputation of the Kisii, and followed my usual custom (when the occasion demanded it) of walking about their country alone and with nothing more deadly than a geological hammer; but it surprised



A KISHI SPEARMAN ON THE EDGE OF THE VINYO ESCARPMENT OF THE
KISHI HIGHLANDS, 6,000 FT. ABOVE THE SEA.



KUJA GORGE AT VINYO.

[To face page 136]

me at the time to find them to be inhospitable and of sullen demeanour, such a striking contrast to the amiability and cheerfulness of the Kavirondo. As the Kisii are an aggressive race—they have probably migrated westwards from the neighbourhood of Kilimanjaro—they do not protect their homesteads with any fence or palisade like the Kavirondo, who have always had to act on the defensive against the raids of the Nandi and Kisii tribes.

Nearly all the men carry long spears eight to ten feet in length, and usually wear a hide. (Plate facing p. 136.) They are certainly less able to carry such heavy loads as the Kavirondo; their women do not smoke and do not go about in the frank and unabashed nudity of the Kavirondo; their costume, which is as ugly as it is dirty, consists merely of a hide tied in front across the loins and allowed to trail on the ground behind them like a train; the effect is far from prepossessing. They prefer coils of iron wire round the neck to the blue necklaces of the Kavirondo; blue beads are usually worn round the waist, just above the skirt of hide. Coils of wire, however, frequently adorn their arms and legs. The head is usually shaved excepting for a topknot—at least, in unmarried girls.

Followed by a villager with a short, stubbly beard to act as my bearer, I reached the summit of the plateau after a rather stiff climb up the steep and wooded cliff of the hard sandstones. Large

slabs and flagstones littered the ground, but a long and exhaustive search along the edge of the cliff revealed nothing but ripple-marks, imprints of rain-drops and sun-cracks. To my great disappointment not a single fossil was to be seen. As soon as I reached the top of the cliff (6047 feet) I hastened to take compass readings and to sketch in the extensive view to the westward, embracing all the country I had traversed ; but the smoke from the many hillside-fires rose thicker and thicker every minute, even making the eyes smart, until the whole landscape below me became completely blotted out in a grey fog of whirling smoke and murk.

During my ramble along the edge of the grassy plateau I could almost have imagined myself back again in England excepting for the intense heat, for the winding path sometimes lay through groves of our common bracken fern, flourishing as well here as on the Surrey hills, and now and again a Painted Lady butterfly flitted overhead, basking in the January sunbeams of the Equator. Both these world-wide organisms must possess remarkably flexible constitutions to be equally at home in our cold, damp climate and in the scorching regions of the Equator. The Long-tailed Blue (*Polyommatus baeticus*) was also abundant on these highlands of Africa and has a similar wide distribution, occurring occasionally in England.

The spectacle of a white man is sufficiently rare here for natives to suddenly materialise apparently

from nowhere, and no sooner had I left the remains of my lunch to my bearer (whose face became wreathed in smiles at the unexpected treat) and stepped aside to look round and to take some photographs, when half a dozen spearmen turned up, eagerly listening to my bearer's voluble remarks. It seemed to me that they were not particularly friendly, judging from their glances and gestures, and that my man was standing up for me, quite possibly with the plausible excuse that I was merely a harmless lunatic ! Although I affected the most complete unconcern, I was in reality somewhat uneasy as to the upshot of this conference of well-armed men.

In this neighbourhood, at the foot of the high cliffs, an attempt had been made some time previously by a Dutchman called Van der Decken, from the Transvaal, to get coal ; but to no purpose, for there are no coal seams here, but only graphite schists, and there is no likelihood of ever obtaining coal in this particular district of East Africa.

I returned to my camp at Vinyo after crossing over to the east side of the high plateau and then descending its steep edge to traverse the gentler slopes of the underlying igneous rock, through fertile *shambas* (holdings) on the rich, red soil and past many native huts, whilst my bearer had to answer a running fire of questions from the inquisitive and unfriendly villagers. Many kinds of fruits would flourish on the sheltered slopes of this wide Kuja

gorge, although only bananas are grown. Still, these were the first banana trees I had seen since leaving the lake shore at Karungu, and even there they did not seem at all happy ; whilst here every plant luxuriated in the damp, red earth, recalling our fertile valleys in the red marls of Devon.

After dark I noticed that the fireflies were gleaming fitfully in the long grass and not flying overhead in short curves, as on all the previous nights on which I had seen them. Hence I was able to locate the source of the light with the help of my electric torch and to discover that it proceeds from a small beetle. To my surprise, however, the greenish-white light was not extinguished by the death of the beetle in my killing-bottle, but it shone on steadily for three or four minutes afterwards. Hence it is clear that the light is in reality a continuous process and that the insect only possesses the power of shutting it off at will, just as a burglar can shut off his bull's-eye lantern, or, as he would more picturesquely say, "dowse the glim."

On the morning of my departure from Vinyo an untoward incident occurred that might easily have ended in disaster. I had given orders overnight, as on all previous occasions, that twenty-seven bearers were to be provided by the headman at sunrise the next morning, so as to enable me to make an early start for Kisii Boma ; but I had not allowed for the feeling of hostility of the Kisii villagers, both to white men in general and to the Kavirondo. Seven

o'clock came and not a man had turned up, although my tent was down and all the loads were ready. So I despatched one of my soldiers in search of the headman with orders to collect all the men he could get. The headman, however, had vanished mysteriously and could not be found. This unusual circumstance struck me at the time as somewhat ominous. A raven came and perched on the tree next to my dismantled camp and began to croak dismally, as if to warn me of impending trouble. Eight o'clock came and went, and the sun was rising higher and higher; still there was no sign of a man, but a pressgang is, of course, always unpopular. So I despatched my second soldier with more stringent instructions. At half-past eight an ominous silence still reigned round about, only broken by the admonition of the raven, for even the women and children of the village were not in evidence this morning. So I sent Omenda in search of my pressgang, and I was left alone with Mahomed, fuming inwardly at the collapse of my plan to make an early start, for it was difficult to exercise patience, which is needed more, I think, in Africa than anywhere else in the world. At a quarter to nine I heard a commotion, and my younger soldier came into sight with a long spear in his hand and rifle on his shoulder, driving in front of him an evil-looking Kisii man and followed by a rabble of excited villagers. Instead of my impassive askari, correct in his discipline, he was

gesticulating and shouting and boiling over with anger and indignation. Still seated in my camp chair (for I had been sketching to pass the time), I asked Mahomed to interpret and in a few disjointed sentences the soldier jerked out that this man had nearly slain him in a murderous attack, not only with the spear, as sharp as a razor, but with a large knife. Now, the croaking of the raven seemed to be justified, and I smelt trouble in the air. Immediately I ordered the man's hands to be bound behind his back, and I told the soldier that I would take the prisoner into Kisii Boma to be dealt with by the District Commissioner. He explained, however, that we should have to use him as a bearer, since only just twenty-seven men had been collected together with the greatest possible difficulty. "Give him, then, the heaviest load," I said, "and see that he does not escape," and then we marched away, shaking the dust of inhospitable Vinyo from off our feet. Excepting for my ever-smiling bearer of the previous day, who gave me a grin of recognition, it was a silent, sullen procession, with none of the outbursts of song to which I had been accustomed in the land of the Kavirondo.

A very steep descent brought us to a stony ford—the thirteenth time I had crossed the Kuja: everything seemed to be unlucky on this morning—and the river was flowing more swiftly and boisterously than on any of the previous occasions, so that I got



LOOKING DOWN THE KUJA GORGE (ABOVE VINYO)
THE KINSUNSI CONE IN DISTANCE. OMENDA IN FOREGROUND WALKING PAST A KISII HOMESTEAD.

an unexpected bath by sliding off a slippery boulder into a deep hole, much to the amusement of my cortège. My discomfiture was the means of instantly converting my bearers from a condition of resentment to cheerful hilarity, for my unexpected bath was greeted with uproarious laughter. The level of the river is here 4894 feet, and, comparing this with the altitude of the ford outside and below the gorge, viz. 4441 feet, we find a fall of 453 feet in $2\frac{1}{2}$ miles; that is to say, a gradient of as much as 1 in 29, amply accounting for the numerous rapids of the Kuja in its rocky bed through the gorge. This gradient stands in marked contrast to the fall of the river in the lower and succeeding stretch to the Sakwa bridge (only 94 feet in a distance of $6\frac{1}{2}$ miles).

The ascent of the opposite slope of the valley was very arduous, and the loads had to be so frequently changed that it was very evident that the Kisii men are lacking in the endurance and stamina of the Kavirondo. On reaching the summit (6015 feet) I utilised the necessary halt by making a sketch of the wonderful view at our feet, looking up the wide valley of the Kuja, which rushes noisily over rapids and waterfalls. Turning to the right, a glimpse of the Kamagambo plateau was visible through the mighty gate of the Kuja, which has sawed its way down through the hard, quartzitic sandstones into the intrusive dolerite beneath. The cone of Kinsunsi, with its aureole of white quartzite, stands like a sentinel at the exit of the gorge. (Plate facing p. 142.)

The men were soon in good humour on discovering a strong echo that was reflected from the opposite side of the deep ravine, and perfect pandemonium reigned for a quarter of an hour with their unearthly shrieks and yells, as we tramped northward along the edge of the precipice. In spite of the heat the air at this altitude is exhilarating, and these high grassy downs would probably make excellent pastures for sheep. Moreover, white men could live at this height without risk of sleeping-sickness or malaria.

At Kitembe I reached the western edge of the escarpment and looked down a thousand feet upon the Kamagambo plateau of gneiss, which we had traversed from Sakwa to Ketch. The view, however, was greatly obscured by the clouds of smoke from the burning hillsides. (Plate opposite.) We now came to the path between Kisii and Kaniamkago, and our progress was quicker as we turned towards the north-east, along the watershed between the Kuja and its chief tributary the Riana. Descending to lower ground, the hill-ridges soon became frequent between the tributaries of the Riana, especially on either side of the Yawi. A whole army of natives was clearing the track of weeds and hoeing it up—a most primitive way of making a road, but quite effective in a country where labour is cheap and where there is no necessity for wheeled traffic. The millet was here in full growth, and I was quick to adopt the native habit of effectually quenching



VIEW FROM THE ESCARPMENT OF THE KISII HIGHLANDS, LOOKING WEST OVER THE PLAIN AT ITS FOOT,
BURNING GRASS IN THE FOREGROUND.

thirst by cutting off a stick of millet near the base, peeling it and chewing the pith without swallowing it. It is rather like chewing firewood, but there is just enough of the sweet sap to make it refreshing ; it relieves a parched throat in a simply miraculous manner. Both sides of the native paths in this district were strewn with sun-bleached boluses of chewed millet-stalk. The path had left the quartzite and had come down to the dolerite, which is much more homogeneous in texture and weathers into symmetrical cones, such as the cone of Saria. In its shadow I halted for lunch ; it was already half-past two, but I could relax a little, for I felt sure now of reaching Kisii the same afternoon. Here, on the col joining the elegant cone of Saria with a spur from the Kisii Highlands in the south, I turned aside to lunch in the inadequate shade of a scrubby tree ; but my caravan by some misunderstanding did not halt at this spot, but went on down the hill to a stream, and only the bearer with the cook's box stayed behind with Mahomed and Omenda. Suddenly I heard a great hulla-baloo, and on going to see what it was all about I found that this particular bearer happened to be the villainous-looking man who had tried to stab my askari early in the day at Vinyo. No sooner had he put down his burden than he bolted into a neighbouring plantation of millet—a very natural proceeding from his point of view—and was soon lost to sight in the forest of stalks over six feet high.

I was really not at all sorry to be relieved of the responsibility of having to hand over the poor wretch to the authorities at Kisii Boma, where he would certainly have been imprisoned. His spear, however, still remains in my house as a souvenir of my march through the Kisii country.

The difficulty of finding a man to take his place was soon solved ; for a native who had strolled up to have a good look at me was immediately requisitioned for the job. Crossing the small stream at the foot of the Saria cone, we climbed up a steep slope of a pink, granitoid gneiss, which underlies the dolerite and forms part of the ancient foundation-rocks of the country. Without further incident we eventually rounded the high bluff of the Nyachwa ridge, and then turned due east along a good road with our goal at last in sight. The heat and toil of the day was all forgotten as I quickened my steps to reach before sunset this distant outpost of civilisation and British rule.

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CHAPTER X

AT KISII BOMA

AFTER the isolation of the previous seven weeks nothing could have been more gratifying than the open hospitality shown to me, a total stranger, by the only two white men at that time stationed at Kisii Boma—H.M. District Commissioner D. C. Crampton and Dr. B. W. Cherrett. The sudden change from monotonous and simple camp-fare to a dinner of several courses in the wilds of Africa seemed in itself an amazing and fabulous luxury, but it was nothing in comparison to the delight of talking freely in my own tongue on all kinds of subjects of mutual interest instead of having to live in lonely communion with my thoughts, day after day and night after night.

It was a good long walk from my camp up to the Residency, and although the stars were shining like lamps hanging in the sky, with a sparkle and lustre unequalled in this country, the night was black and moonless. To see the road I had to be continually flashing my electric torch at regular intervals, like the fireflies which danced in the air around me. My footfall was the only sound until when passing

the barracks of the native police I was startled by a black sentry challenging me with some unintelligible words. He was stationed a little way back from the road, so I thought it was quite sufficient to say "Friend" without halting, merely turning my torch on myself to show him who I was, but he came running after me to satisfy himself as to my identity and general harmlessness !

The Residency is situated on the highest ground of the settlement, at the head of a straight road, bordered by a few bungalows of the officials stationed here and the public offices, leading down to the Riana river. The market and the shops of the Indian traders lie at the lower end of the road around a kind of village green, which is reserved as a camping-ground for Europeans, and here I pitched my tent. The hospital lies close at hand, and from this end of the settlement down to the river-bed there is a long plantation of black wattle (*Acacia decurrens*) and eucalyptus. This belt of trees is a striking object-lesson of what forestry might effect for this country ; planted only three years ago, the trees are already twenty to thirty feet in height and in perfect condition. If the natives could be restricted to the lower ground for their custom of burning the grass for their crops, and if the ridges and summits of the hills were to be strictly reserved for plantations, there would soon be a general amelioration of the climate, particularly in ensuring a steady supply of water for springs and the smaller

rivulets. At present it is only the larger rivers which survive the desiccation of the dry season, because there is nothing to delay the rushing away of the surface-water in violent torrents during the rainy season. If a steady flow of the rivers were again to be assured in this way (for the country was certainly well wooded long ago, before the negroes burned down the forests), then irrigation would be possible in the lower, open valleys, and cotton in particular could be cultivated with signal success, especially in the plains bordering the Nyanza. If the Forestry Department could be liberally supported instead of being cramped for want of sufficient funds, it would be one of the most far-sighted and beneficent actions of the British administration.

Although it is only five years since a military force conducted active hostilities against the Kisii natives, it is a striking testimony to the success of the British rule that at the time of my visit to the seat of government at Kisii Boma only two Englishmen were in residence there, namely, H.M. District Commissioner D. C. Crampton, and Dr. B. W. Cherrett, in charge of the hospital and sleeping-sickness camp. Major Brook, commanding the Police Force, was absent on a tour of inspection through the province. This continual touring of the province by the members of the administration in turn is all the more necessary because there are no other Englishmen in the

entire province ; all the minor positions, such as the Customs officers at Karungu and Homa Bay, are filled, and very ably filled, by Indians.

The government buildings and the bungalows of the officials and of the wealthier Indian traders are built by Indian artisans with red bricks manufactured locally. The striking contrast between such houses and bungalows with modern furniture and luxuries on the one hand, and the primitive kraals of the natives on the other hand, help one to realise in a most vivid manner the similar contrast which must have existed eighteen hundred years ago in England between the Roman villas, more luxurious in many respects than our modern houses, and the huts of mud and wattle of the ancient Britons. It is very doubtful whether the natives, if left to themselves, would ever trouble to continue baking bricks and building houses ; it is so much easier for them to follow the practice of their forefathers in constructing mud huts with grass roofs than to adopt European customs, for no race could be more conservative than the African negro. Here in Africa it became easier for me to understand how it was that the exotic customs of the Romans, their houses and villas, towns and roads and the whole elaborate fabric of their civilisation came to such a sudden and total collapse in Britain so soon as the motive power was withdrawn. The same complete disappearance of European civilisation would take place with even

greater rapidity in Africa if a similar evacuation were to occur ; and in a generation or two there would be little else than the embankments of the Uganda Railway to show that the British had ever attempted to civilise the country.

A capital roofed-in market has been established at Kisii with gratifying results, but the effect has been to greatly increase the prices of commodities, as compared with the current values of milk, sheep, fowls and eggs which obtain among the Kavirondo on the Victoria Nyanza. Still, there is really nothing to grumble at when a dozen bananas cost no more than $\frac{3}{4}$ d. ! The milk was brought in from a distance in open, black pots, about ten inches in diameter, so that it could not be relied upon for purity, and during my two days' stay at Kisii I greatly missed the abundant supply of fresh milk straight from the cow which I had always hitherto obtained.

No regular troops are stationed at Kisii, but only a small detachment of native police, who are, however, trained as soldiers and are subject to strict military discipline. The order and scrupulous cleanliness that exists in their compound, with large round native huts thatched with grass, ought to be an excellent object-lesson to the native civilians ; not a weed or a blade of grass is allowed to grow on the barrack-square of stamped earth. Drilling is carried on by native sergeants, apparently all day long, varied by bugle-calls at inter-

vals. They use the English words of command, but with a ludicrous accent and intonation that is irresistibly funny to listen to. There is still an obvious undercurrent of sullen hostility manifest in the general attitude of the natives, and it has even been found necessary to enact an ordinance that no native may remain seated in the presence of a European, but it did not seem to me that there was any alacrity about the observance of the order.

There can, however, be few parts of the world where a stable and efficient government is carried on by a mere handful of men over so large a district, part of which was even in a state of active hostility only a few years ago. The results which have been so rapidly attained over a population of many thousands with such slender resources augur well for the future prosperity of the colony. The material interests of the natives are also not being neglected, and a beginning has been made to encourage better methods of agriculture and to distribute good seeds of various kinds of plants suitable to the climate. At Kisii Boma even English vegetables, such as beetroot, carrot, lettuces, cauliflower and tomato, can be grown to perfection at the same time that papaws and bananas ripen; whilst millet is a perennial instead of an annual, as at sunbaked Karungu on the lake.

In a Protectorate like British East Africa there are always two parties: the Administration on the one hand and the settlers on the other hand, and

the party of the settlers is nearly always in opposition. They may be aptly termed the parties of long-sight and of short-sight respectively; and spectacles, as in the case of the human eye, are more urgently needed for the latter than for the former disability. The Administration works silently, without advertisement, dispensing justice with even hand between black and white; the officials ungrudgingly sacrifice their health in malarious districts, with sleeping-sickness claiming its myriads of victims on all sides, in their endeavours to secure the *Pax Britannica* throughout the vast territories and to promote the ultimate prosperity and self-sufficiency of the Protectorate. On the other hand, the settlers, for the most part, think only of their immediate interests; the desire to get rich quickly is as keen here, under the Equator, as in the world of Bourses and Stock Exchanges; and it seems difficult for the white settler in the tropics to realise that the blacks were, after all, the original owners of the country, and do not exist solely to be exploited for the immediate monetary advantage of the whites. It seems equally difficult for the colonists to realise that the lives and personal security of the negroes are not absolutely in the power of their white employers. It may readily be conceded that instances of brutal treatment are the exception and by no means the rule, yet if we do not wish to see a wave of retaliation rising among the blacks to avenge arbitrary acts

of cruelty and oppression it is absolutely necessary for the Administration, by strict impartiality, to make the negro feel that he has a right to obtain justice at the hands of his white rulers. Whenever a summons is granted against a white settler for some alleged act of brutality against his black labourer, or, still more, when such acts are proved and a fine imposed, there is a violent protest in the local press, which, it must be remembered, is entirely in the hands of the white settler. Perhaps I may recount a case that occurred at the time of my visit. A cow which was milked by a black boy had been regularly giving a certain quantity of milk every day. This supply began to diminish until it was only half the original quantity. The English colonist accused the boy of drinking the milk, and threatened that if the cow did not yield its usual quantity, i.e. double the amount, the very next day, he would flog the boy. The boy vehemently protested his innocence, and on the next day, lo and behold, he brought the double quantity of cow's milk. The settler thereupon said, "Now I know you were telling me a lie; you must have been drinking it all the time." And straightway he gave him forty lashes with a sjambok. The boy crawled to the neighbouring district and lodged a complaint with the British official, who immediately sent him to hospital, remarking that he had never seen such brutal treatment. Three weeks' continual treatment at the hospital were necessary

to heal the raw wounds made by the whip of hippopotamus hide, and even then the boy's arm withered. Eventually a summons was taken out, the settler was fined a few rupees, and the whole community of his fellow-colonists, as voiced in the press, boiled with indignation at the conviction of a white man and demanded to know the reason why the Government did not protect their interests. Now, why did not the settler get his cow milked by someone else, so as to prove definitely whether it was the fault of the cow or the boy? That is probably what he would have done in England, but in Africa the moral sense of a white man seems sometimes to undergo a strange perversion whenever he comes into economic relations with black men, and it is now found almost impossible to get a jury of white men to convict a white man, however cold-blooded the crime which he may have committed against a negro. When Cole deliberately shot the black for the alleged theft of a sheep, he did not report the assassination, but left the unfortunate man to die in agony on the ground.

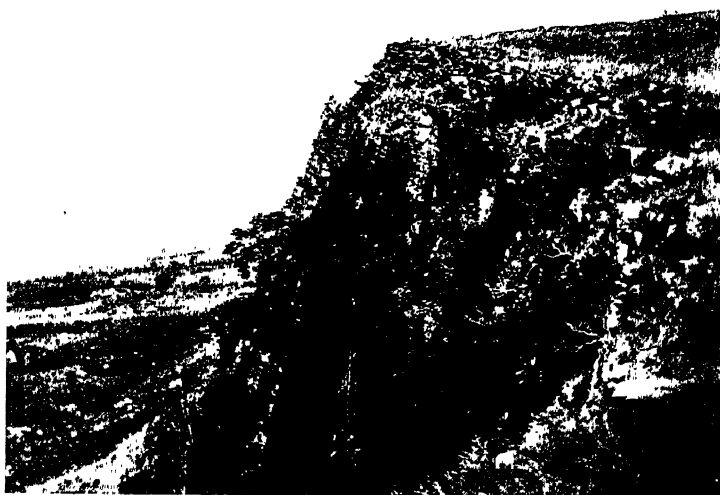
It would seem, however, to be a possible source of weakness in the general scheme to allow the entire trade (at any rate, of this province) and all the minor administrative posts to be in the hands of Indians, who do not spend their money in the country, but send nearly all their wages back to India. An Indian earning fifty rupees (£3 3s.) a

month will save as much as thirty rupees and send it away to his relatives in India, and in this way a considerable sum of money annually leaves the country. It is exactly the system of which the Indians complain so bitterly with regard to the British administration of India. In the Nandi district European traders have combined so that the Indians have been unable to compete successfully and have actually left the district. In default of Englishmen, especially where the climate is unpropitious for Europeans, it might conceivably be advantageous to provide facilities of education to the higher types of negroes, as in the Congo (e.g. at Dima), where Belgian enterprises have been obliged to have recourse to the employment of educated British negroes from West Africa, from Sierra Leone, the Gold Coast and Lagos. The discipline of the native police of East Africa has already yielded striking results in civilising the negro and giving him an active interest in the welfare of his own country, and it encourages a belief in his capacity for steady advancement under British rule.

The day after my arrival at Kisii Boma was spent in one of my lonely tramps across country, accompanied only by a man to carry my lunch and camera, etc., so that I could give the entire day to my reconnaissance. On this occasion the rugged escarpment of Manga was my chief objective. (Plate opposite.) This imposing line of precipitous cliffs lies



MANGA ESCARPMENT (SEEN FROM THE SOUTH-WEST).
NOTE THE NUMEROUS HUTS ON THE FERTILE DISTRICT OF KITUTU AT THE FOOT OF THE CLIFFS.



EDGE OF MANGA ESCARPMENT.

about four miles to the north-east of Kisii and runs from S.S.W. to N.N.E., that is to say, roughly at right angles to the Vinyo escarpment, so that the Kisii Highlands are bounded by these natural ramparts both to the west and south. The path led over a number of rounded ridges of much weathered dolerite, traversed by the Riana and the Miogo, through the thickly populated district of Kitutu, which is situated on rich red soil at the foot of the escarpment. The ground is covered by a monotonous succession of *mtama* plots, only diversified by tall, branching *Dracæna* trees and by groups of the numerous round grass huts of the natives, unprotected by any palisade.

As I approached a gap in the line of cliffs the fragments of rock that lay scattered on the ground soon showed me that the highlands are here composed of the same ancient sandstones as at Vinyo. When I reached the actual edge of the escarpment a most extensive panorama lay open to view in every direction, although it was partly obscured by the haze from the smoking hillside, which rendered impossible any attempt at distant photography. To the east and south, as far as eye could see, the landscape consisted of grassy, treeless downs of the hard sandstone, carved out during countless ages into deep and wide valleys by the Kuja river and its tributaries. The downs of the Kisii Highlands rise gradually to over 7000 feet in the distant eastern heights of Chamonyeru and Mabasi. Curi-

ously enough, the very edge of the escarpment forms the actual watershed between the river systems of the Kuja and the Awach.

To the west the vast mass of Gwasi, nearly fifty miles away, loomed indistinctly above the lowlands at its foot, whilst the strange and bizarre conical forms of Ruri and Sahanga marked the outposts of the great volcano. In the far north the gleaming waters of the Kavirondo Gulf were backed by the rugged Nandi Escarpment. If it had not been for the smoke of the burning grass I could even have seen Kisumu, and communication might usually be carried on by heliograph between Kisii and Kisumu until a system of wireless telegraphy could be instituted.

A long and exhaustive search along the edge of the cliffs (Plate facing p. 160), where the sandstone lay exposed in large bare slabs, failed altogether to reveal any trace of fossils or footprints; nothing but ripple-marks, current-bedding or sun-cracks. The average trend of the ripple-marks indicated a current proceeding, at the time of the deposition of the beds, from the S.S.E. The total absence of fossils renders the question of their geological age a matter of speculation. Similar beds occur on the west coast of the Victoria Nyanza—the Karagwe Series—and on Lake Tanganyika, and have been correlated by geologists with the Waterberg sandstones of the Transvaal, in which igneous rocks (felsites, etc.) occur similarly in the lower half of the series. Yet

this correlation does not lessen the difficulties, for the Waterberg sandstones are referred by some authorities to the Devonian period, by others even to Archæan times. In all probability, however, they were laid down in a freshwater lake, so that the remarkable fact remains that the sea does not seem ever to have invaded the centre of the African continent, but only to have overflowed its borders and a belt across the Sahara to Somaliland.

The Kisii Highlands, rising over 6000 feet above the sea, would be admirably suited for sheep-farming, not only owing to its excellent pastures, but also to the abundance of good water issuing from perennial springs, which even the dry season is unable to check. Freedom from sleeping-sickness and malaria is an additional inducement for the country to be settled by Europeans when communications with the markets of the world can be closely established. There is no reason why in the near future this Nyanza province, which at present only exports hides (and these in diminishing quantity), should not be a great centre of production of wool from the Kisii Highlands. Cotton grows well on the *regur*, or black cotton-soil, in the lowland bordering the main rivers ; and in course of time a steady and unfailing supply of good timber would be obtained from the higher slopes of the valleys and the hill-ridges, if only suitable trees were planted and afforded adequate protection from the natives and the omnivorous goats.

Although the sandstone was once so soft as to be able to receive and retain the impress of raindrops and ripple-marks, it has now become a hard quartzite on which a hammer makes little impression, yet it yields slowly but surely to atmospheric action upon the iron oxide which stains it a deep red along all cracks and joints. The streams of these highlands are chalybeate in character, leaving an orange deposit of iron ochre along the riverbeds; and all this rich iron colouring has been derived from the decay of the highly ferruginous sandstones. The formation of these cliffs is entirely due to ordinary atmospheric agencies, and I was able to observe various stages in the actual process: near the edge of the cliffs the loosening of the texture of the sandstones by the solvent action of atmospheric water upon the iron oxide has resulted in the formation of deep swallow-holes a couple of yards or so in diameter, and in course of time large slices of the cliff face are in this manner rendered unstable and slide down upon the fertile land at the base of the Manga escarpment and are shattered into fragments by their fall.

In returning to Kisii Boma I let my bearer take the nearest way back by rounding the southern end of the great cliffs with their bold and rugged precipices. (Plate opposite.) At first he took me through such a labyrinth of millet plantations that he was sometimes at fault and had to ask his way of the owners. It seemed to me that they regarded me in a



MANGA ESCARPMENT FROM THE NORTH-EAST.
SMOKE RISING FROM THE BURNING GRASS OF THE PLAIN AT ITS FOOT.



NEAR VIEW OF THE CLIFF OF THE MANGA ESCARPMENT,
SHOWING THE BOLD JOINTING OF THE ROCKS.

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very suspicious, not to say unfriendly manner ; after some palaver it was clear that my bearer must have given me a good character, for their change of expression and demeanour was most marked. Here, as on my other geological reconnaissances by myself, the fact of my having shared my food with my bearer raised me very much in his estimation, in spite of my apparent insanity in hammering rocks or using a prismatic compass.

This district of Kitutu, occupying the fertile zone of dolerite at the foot of the quartzite cliffs, was the richest area of cultivated land which I had noticed since passing through the Kikuyu region of the Uganda Railway ; and no doubt there is a great future in store for it. But at the time of my marching through this district the uppermost thought in my mind was a sense of irritation at the pungent smoke which rolled over the landscape, not only obscuring its salient features, but causing the eyes to smart most unpleasantly. Here it was particularly advisable to walk circumspectly, for the firing of the dry grass by the natives has the effect of driving the deadly puff-adders from their usual haunts in the long grass on to the paths. Owing to the general sluggishness of these poisonous snakes it would be easy to step upon one inadvertently, probably with disastrous results, for their venom only takes fifteen to twenty minutes to cause death in a man. A favourite dog belonging to Dr. Cherrett actually succumbed in less than five

necessary darkness and protection for them to pursue their ravages in safety. Yet it is usually held that they only attack dead wood ; perhaps they were merely on their way up to a rotten branch which had been located by their scouting parties. On my disturbing the crust of red earth, innumerable termites were at once visible running about in a great state of agitation.

The morning of the next day of my stay at Kisii was spent in a climb up to Nyachwa—a long spur bounding the Riana valley and Kisii Boma on the south ; and from this lofty standpoint I was able to sketch a most extensive panorama of the whole country extending between my position and the lake and to secure a good series of compass readings all round. The way up to the Nyachwa ridge lay through the native village, where also most of the ubiquitous Indian traders live. Here there seems to be a good deal of intermarriage between the Indians and the natives, and I noticed many half-caste children. The whole hillside and summit of the Nyachwa ridge is intensely cultivated, for it is composed of the same dolerite as at Manga, yielding a rich red soil, and the wide valley of Manyari to the south is thickly studded with native homesteads. Doubtless this dolerite was once roofed over by the old sandstones of the Kisii Highlands, for I found a large mass of snow-white quartzite lying embedded in the eruptive rock, and in all probability it is a fragment (flaked off and altered)

of the sandstone cover, which the dolerite had raised up with irresistible force into a low dome. But in this peripheral part of the district the entire cover of sandstone has been removed by atmospheric denudation in the course of long ages.

Bananas grow and ripen in the valley near the spring (Plate opposite); whilst (as I have already had occasion to remark) nearly all English vegetables can be grown to perfection. Infinitely more could be obtained from the kindly soil and genial climate if the conservative individualism of the natives with their small and separate allotments could give place to a system of co-operation, which would allow large fields to be tilled and labour-saving appliances to be introduced, e.g. threshing machines and—in course of time—even motor-ploughs. Probably more profit would accrue to the English settlers if they were to devote more of their attention to the possibilities of trading, whilst stimulating the natives to adopt improved methods of agriculture, instead of leaving nearly the whole of the retail trade in the hands of the Indians.

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BANANA GROVE NEAR THE SPRING AT KISHI BOMA.

CHAPTER XI

BACK TO THE LAKE

THE fact of my camping at the seat of administration of the province spared me the difficulty which I had experienced at Vinyo of procuring bearers. Omenda and his colleagues in the native police had easily commandeered the necessary number of men for my two days' march to Homa Bay, and thus I was enabled to make a fairly early start. Up to eight o'clock I always found the march exhilarating and stimulating. But the sun in its upward climb in the heavens becomes pitiless in its power; and how leaden-footed and parched one becomes between noon and two o'clock!

We kept to the road at first, as far as the northern end of the Nyachwa spur, and here we took to the open country, along a more direct track, leaving the dolerite for the underlying gneiss, which has weathered to a crimson-brown sandy earth, more than six feet in thickness. This gneissic region forms a wide upper terrace of the vast peneplain or ancient weather-worn plateau, which extends from the Kisii Highlands as far as the basalt plains of

the Gwasi system ; and each terrace of the plateau marks a separate period of relative uplift.

The narrow, winding, stony path led us up and down the wide valleys of several left tributaries of the Riana, and we halted for a short time by the side of the Yana river for the bearers' loads to be altered and readjusted. (Plate opposite.) After passing through endless native plantations, where millet grew side by side with the common bracken fern of our own islands, we rejoined the road for a short distance, but soon left it again to cut off another great loop ; since the road is intended for bullock-carts (and in the near future even for motor-cars), it has often to make wide détours so as to negotiate the deep valleys without the help of long and expensive bridges.

At last a steady descent led down to the Riana, the border-line between the Kisii and the Kavirondo countries, and we crossed the river by stepping-stones polished by the tread of generations of naked feet. (Plate opposite.) What a contrast there was in the demeanour of my Kavirondo bearers as soon as we reached the opposite bank, leaving the hated country of the Kisii behind us ! Omenda had been able to secure at Kisii Boma his own countrymen for my bearers, and whilst up to this moment they had tramped along in unwonted and sullen silence, now they burst out into exuberant song, unmelodious enough to my ears, yet clearly expressing jubilation of a most emphatic kind.



A HALT BY THE YANA RIVER.



STEPPING STONES OVER THE RIANA RIVER.

Turning back for a last glance of the Kisii country, I noted the well-marked contrast on the one hand between the level peneplain of gneiss extending far away to the west, crowned by the dolerite cone of Saria, and on the other hand the upper plateau of gneiss, marked by the rounded dome of Meriba on the north, while the quartzite highlands of Kisii barred the view in the distant east. (Plate facing p. 168.) The large and straggling village of Kitawi on the sloping ground of the left bank marks the last outpost of the Kisii tribe. The great width of the valley—its slope only amounts to an angle of eight degrees—clearly shows that it is of great age; but its numerous rapids, on the other hand, indicate a recent rejuvenation, just as in the case of the Kuja river.

When at length I reached the summit of the right bank I came again into the road, which we now followed for the rest of the journey to Homa Bay, excepting for occasional short cuts across the valleys of the plateau. These broad valleys of the Nyakuru and its tributaries extend to the southwest to join the Riana, but they were quite dry at this time of year. Their formation must go back to a period when springs were more abundant and more active and the climate considerably moister than at the present day. The desiccation is doubtless due to the extensive deforesting which has been practised by the natives for countless generations. Only small scattered trees occur now on the broad

slopes of the valleys—wild olives, acacias and other spiny growths carrying on a precarious existence, but affording a welcome shelter for any birds. As we marched up a long, gradual ascent, with the blazing sun on my back, it was quite cheering to hear sweet, melodious notes closely resembling the song of our own blackbird.

The soil is here yellow and sandy, resulting from the weathering of ancient gneisses and schists, and is evidently not so fertile as the red clay of the Kisii foot-hills. It would, however, probably be well suited for plantations of coniferous trees, such as firs, junipers and cypresses.

My halt for lunch was at a hamlet called Sorikodongo, the first Kavirondo settlement since leaving the Kisii territory at the Riana. The friendliness of these genial, naked savages was a great relief after the sullen and hostile attitude of the Kisii natives, and their innate politeness prevents their natural curiosity from degenerating into ill-bred inquisitiveness. Scarcely had I sat down in the shade of a bush, after exchanging a few polite expressions of mutual friendliness with the headman, when suddenly a man came rushing breathlessly up the slope from the plain in the west. In a great state of perturbation he jerked out his news in a few agitated words. Immediately a dozen or more of the Kavirondo round about me rushed down the hill with the messenger of ill tidings to a village about half a mile away. In answer to my enquiries



THE GRANITE DOME OF MERIWA.
THE RIANA VALLEY ON THE RIGHT—DRACENA PALMS IN THE FOREGROUND



PLATEAU NEAR KITAWI
(CONTINUATION OF THE ABOVE PICTURE).
THE SARIA CONE IN THE DISTANCE.

as to the cause of the disturbance I was told that an old woman was lying there at point of death. It was, indeed, soon evident that she had just died, for a great wail of lamentation floated up to my ears, rising and falling like the lowing of oxen, and it continued without a moment's intermission for over half an hour, when it gradually died away, apparently from sheer exhaustion on the part of the mourners, doubtless to be soon renewed, but my halt was too short to hear the sequel. It was, indeed, not possible for me to turn aside so as to see for myself the cause of all the disturbance, for the afternoon was too far advanced and we had still several miles to tramp. It would probably have been an interesting and profitable place to investigate, from an anthropological point of view for there was an impression left on my mind of greater originality and individuality about the natives of the settlement than in most of the Kavirondo villages which I had visited; for instance, most of the men wore their hair quite long in thin ringlets (plastered with greasy red ochre) reaching down to their shoulders, and the thick mop of hair reminded me forcibly of the wigs of the ancient Egyptians.

At Sorikodongo I left the region of ancient gneisses and schists and entered upon a more fertile region composed of dark green, compact epidote rocks, which probably represent much altered volcanic rocks of a basaltic type. The

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weathering has, however, taken place to such a depth that it was rarely possible during a quick traverse of the country to halt long enough to hammer away sufficient material to secure a piece of really fresh and unaltered rock. Just before coming to Languah and in the valley itself the rock is more definitely of an intrusive eruptive character (a diabasic teschenite).

Languah is a small settlement of Indian traders, about eighteen miles from Kisii Boma, and practically half-way between Kisii and Homa Bay. I crossed a little stream by a bridge and camped on the further side of the blot on the landscape formed by the hideous Indian huts of corrugated iron. Wide, grassy country now lay open to my view, and it was evident that I had returned to the volcanic region of Gwasi with its northern outposts of Ruri, Sahanga and Homa, all conspicuous landmarks with jagged, bizarre peaks on the northern and western horizon. The country between Languah and Homa Bay is, indeed, merely a succession of low, rounded spurs and hogbacks, and the rivers in this district all flow to the north-east, viz. towards the Kavirondo Gulf of the Nyanza, instead of inland to the Riana river in the south-west.

An early start was possible on the following day owing to the great advantage of having engaged the bearers at Kisii for the two days' march to Homa Bay. This was, of course, the system I had wished

to adopt from the beginning, but the men at Kachuku were so independent that they absolutely declined to leave their homes even for three weeks, and so I had to rely on the unsatisfactory proceeding of enlisting a fresh set of bearers at each village where I camped. A late start was, of course, the inevitable result, including the necessity of having to march right through the heat of the day until the late afternoon, to say nothing of the difficulty of securing enough men for the next stage of my journey—a difficulty which culminated in my awkward experience at Vinyo, which I have already related.

Nothing could have been pleasanter than marching in the clear, cool air of the early morning, when the distant hills stood out sharply silhouetted against the cloudless blue sky. By eight o'clock, however, the sun had rapidly gained in intensity, and the heat from this hour onwards became distinctly excessive, whilst the hot air rising from the sunbaked ground caused a shimmering haze, which sometimes even yielded a mirage. This phenomenon was particularly noticeable along the road when I was still about five miles away from the lake shore. When I stooped down a little the road seemed to end in a wide lake of water, tantalisingly cool in appearance when the temperature is 110° F. in the shade; yet the Nyanza could not by any possibility have been seen from this standpoint. The illusion vanished immediately I stood

upright so as to look at the road at a more acute angle.

The men were very cheerful, not to say boisterous, at the prospect of reaching Homa Bay and their journey's end, and expressed their delight by loud outbursts of song, joining in a chorus whenever the chief vocalist gave the signal by a long-drawn-out "Eh-eh-eh-eh," after the most strenuous and discordant efforts on his part to break his voice.

As I approached the lake I found that the Arodyo and Rungwena rivers had cut their valleys deeply into the plateau, revealing layers of coarse and fine volcanic ash, but unfortunately with no trace of the fossils which I had eagerly hoped to find on my return to the shores of the lake. These beds, which testify to much violent eruptive action on the part of the volcanoes of the Gwasi system, rested on ancient quartz-porphyrries, and there was no sign of the Miocene deposits of Karungu Bay, which are in point of fact of much older date than these bedded volcanic tuffs.

A good stone bridge spans the Rungwena river almost under the shadow of the Asego cone. (Plate opposite.) The photograph shows the characteristic symmetrically conical shape in which these basalts weather, especially on the margin of the volcanic plateau, owing to the very homogeneous nature of the rock. In this region there are quite a number of these cones, e.g. Asego, Uchimbo, Chamanga,



BRIDGE OVER THE RUNGWENA RIVER.
ASEGO CONE IN DISTANCE—CANDELABRA EUPHORBIA IN FOREGROUND.



RUNGWENA (ARODYO) RIVER, LOOKING UPSTREAM
FROM THE BRIDGE.

Orian, etc., which rise with great abruptness from the surrounding alluvial plains and form very conspicuous natural features of the scenery.

The return to the region of basaltic lavas (belonging to the class of nepheline rocks) had brought about a return of the associated black cotton-soil (with land-shells), which had been such a noticeable feature of the basalt region of Karungu, but it did not reach quite the same thickness, not exceeding five or six feet. It is evidently just as well suited for growing cotton plants as in India, for I noticed a small but healthy field of cotton near Homa Bay, belonging to one of the Indian traders. Here, as in the Karungu region, the impervious substratum necessary for the formation of this black, alkaline earth consists of a brown, clayey "loess" due to the disintegration of the basalt, rich in silicates of soda.

The very gradual ascent up to the top of the plateau from the Rungwena valley seemed interminable in the glare of the noontide heat; but I was well repaid when at last I stood on the last ridge of the rolling plateau above the lake and could parody Xenophon by shouting, "Nyanza, Nyanza!" Although streaming with perspiration and pestered with flies,—all such discomforts were forgotten in my eagerness to reach the waters of the great lake, reflecting the deep blue of the Equatorial sky. The view was magnificent, for Homa Bay is embowered in hills, the cones of

Sahanga on the west and the rugged crest of Homa Mountain in giant isolation on the east; whilst in the far distance the lofty Nandi escarpment shut in the waters of the lake with a purple wall of jagged peaks. (Plate facing p. 6 and opposite.)

As soon as my camp was pitched I hastened down to the shore, where the muddy beach was thickly strewn with freshwater shells: *Paludina*, *Ampullaria*, *Cyclas*, *Unio*, etc. Here there was a stretch of open water, free from ambach swamp and without any signs of the crocodiles which in reality swarm in the shallow waters of Homa Bay in incredible numbers; and so I felt able to collect shells at my leisure. At a spot where a fishing-boat was drawn up on the gently shelving shore I found numerous specimens of the so-called freshwater oyster, which is really no oyster at all, but an *Ætheria*, allied to the freshwater mussel, *Unio*. The lower valve of the shell adheres closely during its growth to the stone on which it settled when young, moulding itself to all inequalities, and as a result assumes all kinds of distorted shapes.

The natives in this district are expert fishermen. They make a kind of seine-net with papyrus stems. Whilst one end is made fast to the shore the other end is towed out by a boat and brought round again to the land in a wide curve, when it is hauled in, thus driving the fishes enclosed in its arc nearer and nearer to the beach. Here large funnel-shaped wicker baskets are ranged close together in



VIEW ACROSS HOMA BAY FROM HOMA.

HOMA MOUNTAIN IN BACKGROUND; AMBACH TREES IN FOREGROUND; SHILLY BEACH.



CHAMANGA HILL.

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the shallow water, and finally the fishes are driven into these baskets by the drawing in of the net aided by the women rushing into the water and brandishing sticks to complete the confusion of the terrified fishes. These fish-baskets are beautifully and regularly woven from strips of papyrus. It is a common sight to see the women returning home from the fishing, each with a fish-basket over the water-jug on their heads, presenting in caricature the appearance of a fashionable hat, and their complete nudity heightens their ludicrous appearance. (Plate facing p. 176.)

The undoubted talent of the Kavirondo for plaiting might with adequate encouragement and tuition be turned to considerable commercial advantage in making such articles as panama hats, baskets of all kinds, etc.

The trading station of Homa Bay is entirely inhabited by Indians, and seems to be in a very prosperous condition. The number of Indian shops was greater than I had expected, yet the only vegetables I was able to obtain were small onions. These were, however, by no means to be despised, for cold boiled onions form a most refreshing addition to one's lunch in this torrid climate.

There is a good deal of transport between Homa Bay and Kisii on the one hand and Karungu on the other; and I noticed that bullock-carts were being built by Indians on the spot for the carrying trade to Kisii. The little schooner calls regularly

every week, bringing goods from Kisumu. Here, as at Karungu, the Kavirondo natives buy up considerable quantities of iron and brass wire and blue glass beads for their personal adornment, as well as iron heads for their hoes (*jembes*).

The Customs officer, or *karani*, is an Indian, but he knew hardly any English, and I missed the eager willingness with which Hakim Ali, the *karani* at Karungu, had come to my assistance whenever I required any information or any little service. Whilst I changed some paper rupees for cents in the Customs shed down by the jetty I met a young Indian assistant who could speak English quite fluently, if not correctly, and from him I gleaned an interesting bit of information that to the north of Homa Mountain lime was being burnt in a kiln for a Kisumu trading firm, Messrs. Bousted and Clarke. Thereupon I abandoned my original intention to take the schooner at Homa Bay, and I left a letter for the negro captain to take to Mr. Ainsworth at Kisumu, asking that the boat might instead be sent to call for me at Kendu. Thus I only stayed a single night at Homa Bay, where there was no sign of my Miocene beds, but only basalt and tuffs; the mere presence of limestone held out to me a possibility of fossils of some sort, and the chance was too good to be missed, although only a very few days now remained at my disposal before I was obliged to return to Europe.



KAVIRONDO FISH BASKET.



KAVIRONDO WOMEN CARRYING FISH BASKETS.

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CHAPTER XII

HOMA BAY TO KENDU

AN unexpected difficulty now turned up, much to my surprise and disappointment. Omenda, who had only expected to come with me as far as Homa Bay, informed me that he could not accompany me to Kendu. Naturally, I felt a little blank at this defection, which left me entirely to my own resources, for I no longer had my escort of two native police, who had left me at Kisii Boma. Immediately I betook myself to the *karani*, as the local representative of Great Britain, but on my applying to him for the loan of an askari for a few days I was met with a polite but decisive *non possumus*, on the ground that he would be exceeding his powers if he were to accede to my request. Like the majority of the Indian officials, he could not act on his own responsibility. So I returned to my tent and sent for Omenda, thanked him for the services he had rendered me for the past two months, and gave him a parting gift in rupees (evidently somewhat more than he had expected, if I might judge by his broad grin and gleaming eyes) and a bottle of quinine tablets, a *darwa*

(medicine) which met with equal appreciation, for I had dosed him with quinine several times for malaria whilst in camp at Kachuku. At the same time I told him that I was much disappointed at his wanting to leave me before I had quite finished my journey and that I had formed a higher opinion of his sense of duty and of his attachment to me. So far as my knowledge of Suaheli went it seemed to me that Mahomed interpreted this part of my homily in rather stronger terms than I had expressed. At any rate, it had the desired result, for at six o'clock the next morning Omenda turned up and informed me that he would, after all, come on with me to Kendu if I would write a letter of explanation to Mr. Crampton to put the matter right, and of course I readily assented to this suggestion. Omenda had, indeed, risen to the occasion, for he had not only secured the necessary number of porters for the march to Kendu, but he had proved himself more efficient than the Indian *karani* by obtaining the services of a couple of native police for my escort.

With this prompt and willing assistance the day began auspiciously. Camp was soon struck, and we made an early start, turning eastwards, between the conical hills of Asego on the south and of Simenya (composed of volcanic tuff) on the north, and at intervals obtaining glimpses of the still waters of Homa Bay. Crossing the dry, alluvial bed of the Sota river, we ascended low, rounded

spurs extending northwards from Najanja to jut out into the lake at Kumbogo point. We had left the black, basaltic lavas and now traversed their ancient platform of crystalline rocks, consisting of a dull purple quartz-porphyrity, barren and rocky, causing an astonishingly sudden change in the landscape, in striking contrast to the gentle contours of the basalt. No sooner had I crossed the spur than I found that it was bordered on its eastern side by a narrow zone of gypsum in thin white layers alternating with yellow, clayey bands. The outcrop was broken up into numerous blocks tilted in all directions, and it took me some time before I could find a sufficiently long stretch of undisturbed beds for the purpose of measuring the true angle of inclination of the strata. In fact, I became so intently absorbed in my examination of this somewhat unexpected occurrence of a lacustrine deposit, and in searching for any possibly fossiliferous clays or gravels, that when at length I looked for my caravan not a man was in sight, and by some unusual forgetfulness even my faithful Ma'homed had disappeared with the rest. Hurrying on to catch them up, I evidently mistook the path, for after tramping at top speed for twenty minutes across a wide river-plain by a well-beaten track there was still, to my surprise, not a sign of my bearers. On glancing at my compass I found that the path was steadily bearing round to the south-east, whereas the direction of Kendu

lay certainly to the north-east. Now, I could safely assume that the headman of the bearers knew his way to Kendu perfectly well, so there was nothing for it but for me to make a bee-line in a north-easterly direction and to trust to hearing or seeing something of my caravan before they should reach the ford over the Awach river. But it was now nearly ten o'clock and the sun was already high in the heavens, so that it was no slight undertaking to struggle on beneath a sky of brass over broken ground, deeply cracked by the heat of the dry season. I often stumbled over big tussocks of coarse grass and reeds in my eagerness to traverse the burnt-up plain, which seemed to be never-ending. It was even difficult to see clearly ahead, for everything was shimmering and distorted by the hot air streaming up from the ground baked as hard as any brick, and my spectacles became dimmed with the perspiration dripping from my forehead, so that I had to be continually wiping them. When at last I reached a labyrinth of low, conical hills of basalt which shut out the view to the eastward I could still not detect the slightest sound of human voices, and it surprised me still more on coming to the wide plain of the Awach river to find that the same complete silence prevailed. It was some time before I struck a path leading in the right direction. I was now able to nearly double my speed owing to the greater ease of walking, in spite of the path continually twisting and turning like a corkscrew,

for it is apparently impossible for a negro to walk straight even on level ground. If there is any obstacle in the path, it is less trouble for him to walk round it than to remove it.

I had almost given up all hope of overtaking my bearers when, to my great relief and delight, I heard the unmistakable raucous singing of Kavirondo men proceeding from a line of trees which marked the winding course of the Awach. Here I found my bearers resting in the welcome shade after having forded the shallow stream. Omenda and Mahomed had only just realised that I was not immediately behind them, and were on the point of instituting a search when I turned up. I never knew shade to be such a boon (or coffee from a thermos flask more refreshing) after my exertions in a heat greater than any I had hitherto experienced.

Now that I had returned to the neighbourhood of the lake the heat was much more trying to bear than during my march up to the Kisii Highlands, doubtless owing partly to the greater humidity of the air and partly to my being within a few miles of the Equator. To some extent, however, the increased fatigue was due to the effects of dysentery, which threatened to renew its hold of me as soon as I began again to drink water from the lake. So long as I was able to obtain river water the distressing symptoms had abated, and finally ceased at Kisii Boma, owing to some salol with which Dr. Cherrett had kindly provided me, and it was

evident to me that swiftly flowing (and therefore well-oxygenated) water of a river is not a favourable nidus for the amœba which causes this disease—a disease more dangerous and likely to lead to a sudden and fatal termination than malaria. No doubt the lake water when collected some distance away from the shore is wholesome enough; but the native women, owing to their natural and well-grounded fear of crocodiles, are in the habit of filling their pitchers from shallow, nearly stagnant pools or lagoons behind a bar of sand. It can readily be imagined that under these circumstances microscopic organisms flourish in the green water festering under the vertical sun of the Equator. The rapidity with which dysentery claims its victims in these latitudes was forcibly brought to my mind by an occurrence related to me on my homeward voyage by a military officer. He was playing tennis one afternoon at Mombasa with a charming young English girl apparently in perfect health and spirits. The same evening she was taken ill with dysentery and died early the next morning. By the afternoon she was lying in her grave, within twenty-four hours of her light-hearted game of tennis, when death seemed furthest from her thoughts.

Whilst resting at this ford over the Southern Awach (or Aloych, according to Omenda) the headman, to my surprise, announced that he could do the complete march to Kendu in a single day in-

stead of making two marches, as I had been led to expect. Since I had only a very few days now at my disposal this suggestion fitted in exactly with my wishes, although it astonished me to find a Kavirondo willing and even eager to make a double march instead of the usual thirteen miles which in the ordinary run of things is considered quite sufficient by porters here on the Equator.

It was, however, with some reluctance that I left the shady grove and the cool sound of running water, although in reality its temperature was 80° F. ! But I was now able to cross the northern half of the hot, alluvial plain in a more leisurely manner. Here and there a thin scrub of scraggy and spiny acacias diversified the level surface. The alluvial clay gave place to black earth, from which isolated, conical hills of basalt rose up abruptly, such as the cones of Uchimbo and Chamanga or Chamvanga, as Omenda called it. These remarkably symmetrical hills mark the final form assumed by the nepheline-basalt when carved out by atmospheric denudation, assisted, perhaps, by the action of the waves when the lake stood considerably higher than at the present day. (Plate facing p. 174.)

From the plain it was a long and gradual ascent up the slope of a rounded ridge of quartz-porphry. We passed only a single village, Kumgenda, for the ground is here very barren and stony in comparison with the fertile black earth and volcanic tuffs of Homa Bay. The bare rock reflected the vertical rays

of the noontide sun in a manner trying alike to sight and temper, so that the march up to the summit of the ridge seemed as if it would never come to an end. But there was some compensation for the tiring climb, for now from this commanding situation I could see in the far distance the blue water of the lake and a speck which I was told was Kendu, —the final stage of my overland march across the Nyanza province from Karungu. It lay at the northern limit of a most extensive plain, which was bounded by the rugged volcanic scarps of Homa Mountain on the west and by rounded ridges of ancient gneiss and schist on the east.

Although the majestic height of Homa Mountain lay too far away from my route for me to visit, especially as we were making a hurried march, yet now that my goal was in sight I sent on my men in advance and made a *détour* by myself to investigate a long spur of the mountain jutting out into the plain. The rock (a phonolite) turned out to belong to the same family of nepheline-lavas as the rest of the Gwasi system to the south of Homa Bay. It overlies a calcareous travertine which it had altered and baked, to some extent. From some information which Dr. Cherrett had kindly given me at Kisii Boma I had hoped to come across some indications of oil springs in this district, but if any such exist in this district they must lie further to the north-west, perhaps near the Kimera swamp. Even in an old water-hole which I came



KAVIRONDO BEARER OF KENDU AT THE LOW CLIFFS OF THE VICTORIA
NYANZA BETWEEN THE AWACH RIVER AND HOMA MOUNTAIN.



LARGE SYCAMORE FIG NEAR KENDU.

across there was no trace of any oil film, and my hopes were again dashed to the ground.

Returning to the track of my caravan (now far ahead), the heat in the sandy plain grew hourly more intense, and I was unfortunately compelled by force of circumstances—that is to say, by Mahomed's wayward fancy—to lunch in the midst of the open plain, without a scrap of shade, and the brown and burnt-up ground was almost too hot to sit down upon. Needless to say, I did not linger over my simple fare, but as soon as ever possible I tramped on for another two miles beneath the relentless rays of the sun, which seemed as if it would bore a hole through my skull, in spite of a pith helmet. Tired and unspeakably hot I reached at length the banks of the Northern Awach river, a muddy stream scarcely twenty feet wide, and to my great delight a giant sycamore fig tree rose to a lofty height on the south bank, furnishing a dense and most refreshing shade, although the shade-temperature was 105° F. (Plate facing p. 184.) These huge trees only occur at rare intervals and must be of considerable age, although not showing any signs of decrepitude. They are the survivors of a long distant period when vast forests extended over the whole of the Equatorial regions, as indeed they still do in the Congo basin. The natives, with their wasteful agricultural methods of clearing the ground by burning, are, of course, responsible for this widespread and irreparable destruction. In

fact, it seems to be only the immense size of these trees that prevents the natives from chopping them down for firewood.

With reluctance I left the shade of centuries and forded the Awach, to trek across another blazing stretch of sunbaked plain before reaching Kendu. A low, rounded hill, however, lay across our track, and to my surprise, on reaching the summit, I found myself gazing down into the emerald-green waters of a crater-lake called Simbi. The expanse of the still water is nearly oval in outline, and I found that the lake measures half a mile in width and three-quarters of a mile in length (from north-west to south-east). Not a ripple disturbed the glassy surface, and the only visible sign of life consisted of a few ducks swimming lazily about and of a number of wading birds, with stilt-like legs and upturned beaks like avocets, searching for food along the margin of the muddy shore, where small patches of a green jelly indicated the presence of a low form of plant (*Nostoc*). (Plate opposite.)

The water is exceedingly alkaline, impregnated mainly with carbonate of soda, and it is indeed somewhat surprising that the ducks can put up with the nauseous flavour of the water whilst feeding on the water-weed (*Conferva*, etc.), which gives the lake its bright green colour. Fish-eating birds, such as cormorants, divers and pelicans, which are so abundant in the neighbouring waters of the Victoria Nyanza, are entirely absent from silent



NORTH AND WEST SHORE,
SEEN FROM EAST. HOMA MOUNTAIN IN BACKGROUND.



EASTERN AND NORTHERN SHORE.
CANDELABRA EUPHORBIA IN THE FOREGROUND.

LAKE SIMBI.

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Lake Simbi, and it is evident that no fish can live in its alkaline waters.

When I visited the lake two days later, in order to map it and examine it more closely, I was able to satisfy myself that the lake actually occupies the site of an explosion-crater, from which, however, no lava has ever issued. It is only in a few places on the southern shore that solid rock is visible, and here it consists of a micaceous sandstone of fairly recent geological age (probably late Pliocene). Elsewhere the crater-wall is formed of thin layers of clay, dipping on all sides away from the centre of the crater, just as in the explosion-craters of the Eifel district in Germany, which have similarly become filled with water.

It is quite within the range of possibility that the explosion took place in historic times, for I was told a legend by Omenda to the effect that the site of Lake Simbi was once upon a time occupied by a hill crowned by the homestead of a very bad chief. His crimes, whatever they may have been, did not go unpunished, for in a single night the hill, together with the chief's home, was suddenly destroyed, and ever since the lake has taken its place. Now, the memory of natives is notoriously short, and since the Nilotic Kavirondo have, so far as can be ascertained, only migrated to their present homes about two hundred years ago, it is not unlikely that the explosion was in point of fact a comparatively recent occurrence.

The surface of the lake is steadily rising in level, for I noticed several instances where some *candelabra euphorbia* trees have succumbed to the deleterious effects of the alkaline water, and now only appear as dead, half-submerged stumps, bleached by the sun. Probably the springs which gave rise to the lake are still active.

At first sight the still water of the lake looked very inviting for a swim, from which I had hitherto been debarred in the Nyanza, owing to the swarms of crocodiles. The absence of fish in Lake Simbi rendered it unlikely that any crocodiles existed in this pool of silence. Even this negative advantage was considerably discounted not only by the unpleasant fishy flavour of the carbonate of soda in the water, but still more by the rank vegetable smell (somewhat recalling cabbage water) which pervades the whole atmosphere around the lake.

On the northern shore a Kavirondo woman and her two children were laboriously scraping the efflorescence of soda from the margin of the lake and collecting the thin crystalline crusts in wicker baskets. When I enquired of the headman at Kendu to what use this soda was put, he told me that the Kavirondo mixed it with their tobacco (a custom which they share with the Masai, who chew tobacco when mixed with soda), and also with their food in place of salt. The nauseousness of the mixture would be unendurable to Europeans, but there seems to be no limit to the perversity of



NORTH-EAST SHORE.



SOUTH AND SOUTH-EAST RIM.

LAKE SIMBI.

[To face page 188

human tastes, and it is, after all, not very surprising to find this additional peculiarity in a people who consider the entrails of animals to be titbits and who sour their milk with the urine of cows !

From the rim of the Simbi crater it was not more than half an hour's march across the plain to the little settlement of Kendu. It had been an exhausting day, but a bath, a change and some tea soon revived me, and as soon as I had got my camp in order I hastened up the Gendia hill (about a mile and a half from Kendu). From its summit a church and a mission house look down upon the plain and the Kavirondo Gulf. Eagerness to speak with people of my own race quickened my footsteps, and my expectations were more than realised by the warm and hospitable welcome which the Canadian missionary, the Rev. A. Carscallen, and his charming Scotch wife so freely extended to me, a total stranger, dropping down suddenly in their midst from the hinterland. Their bright, curly-headed boy of three summers did not seem to have suffered in any way from the hot climate—a striking testimony to the unremitting care of his parents and the healthy situation of their airy house on the hill.

It was a delightful evening for me after the loneliness of the past two months, but it gave me a bad attack of homesickness that night, for another month had still to elapse before my return to my own home so far away, and my task was not quite finished.

Apart from Mr. Carscallen's spiritual labours among the Kavirondo, concerning which I am not qualified to express an opinion, it was obvious to me that his medical and civilising work has already been of inestimable advantage to a race that knows nothing of the most elementary laws of hygiene.

Early the next morning I commandeered a bearer to accompany me on my tour of exploration westwards along the coast, but it was soon evident to me that the physique of the Kavirondo on this coast is vastly inferior to that of their countrymen near Karungu, and they are unwilling, as well as incapable, of bearing such heavy burdens. This disability is, however, largely due to their pernicious habit of smoking *bhang*, in spite of strenuous efforts made by the British Government to stamp out the cultivation of the hemp plant. Not only are the people shorter in stature, but their muscles seem flabby, and the effect on the brain is particularly noticeable. The contrast in energy between old and young is strongly marked, for the boys are fond of an uproarious game of hockey, played with a wooden ball, and their violent exertions beneath the blazing noontide sun, which would soon strike down a bare-headed European, filled me with amazement.

My hopes of finding fossils were raised after crossing the Awach river near its mouth by finding low cliffs of micaceous sandstone and clay, extending for several miles along the coast. But the most

careful examination failed to reveal the slightest trace of any fossil. Tired and hungry after several hours of fruitless search, I was on the point of turning back when I espied a solitary thorny tree still a mile further west, beyond the termination of the sandstone cliffs. It promised some scanty shade or, at any rate, something to lean against during my midday meal. So I pushed on, and during my halt I scanned the low coast-line with my field-glasses for any indications of geological structure. A dazzling white patch instantly arrested my attention and filled me with fresh hope. Impatiently I strode over the rough ground, and my anticipations were fulfilled, for the white patch resolved itself into a travertinous limestone with bones and teeth of buffalo, zebra, etc., and two large fragments of elephant's tusks, about five inches in diameter, completely mineralised. Greatly to my surly bearer's disgust I filled up his box with fossils, disregarding his repeated exclamations of "*Pek, pek*" (heavy). A Karungu Kavirondo would have thought nothing of the load, but this *bhang* smoker grumbled so unpleasantly that I had to pretend to fly into a towering rage, using all the strong words in Kavirondo and Suaheli at my command, before he would pick up the box and march back to camp. (Plate facing p. 184.)

I had now only two days left, and at first I thought of moving camp to the new locality, but there was no village in the vicinity. Hence there

would be a difficulty in obtaining supplies even for a short stay, and still greater difficulty (now that Omenda and my escort of native police had left me) in procuring bearers for the return journey to Kendu. So I had to make up my mind to tramp the distance each of the two days, whilst I left Mahomed in charge of my camp. It was no easy matter to get men at Kendu to act as bearers, since I no longer had a pressgang at my disposition, and I had to content myself with only two on the following morning, so as to be sure of making a fairly early start. This time I marched direct to the spot where I had discovered the fragmentary bones and teeth, and as I found I had more time in hand than on the previous day, I resolved to see if there were not any more favourable exposures of the fossiliferous beds still further along the coast, near to the spot where I had been told a limekiln was in active operation. At noon I reached a colossal sycamore fig tree, and here I could see a wide stretch of the travertinous limestone. On hastening to the spot I was delighted to find the remains of an elephant's skull. Unfortunately it had been hopelessly battered and destroyed, apparently by natives collecting limestone for the kiln, and all that I was able to secure was one side of the lower jaw with the teeth as well as some of the teeth of the upper jaw. The tusks had been hopelessly shattered into splinters. The bones were, however, so massive and heavy that my two degenerate Kavirondo were

unable to carry all of them, and I had to repeat my hot twenty-mile march once more. This time I could only secure five men, but I countered their grumbling at the heaviness of the loads with judicious gifts of cigarettes. I could see at once that the teeth differ markedly from those of the modern African elephant and resemble the old Mediterranean form (*Elephas meridionalis*); for instance, the ridges are more numerous and narrower instead of being lozenge-shaped. Remains of a similar form of elephant have been discovered to the north in the Omo valley of the Lake Rudolf region, and more recently to the south in German East Africa. At the time when this elephant roamed about on the shores of the Kavirondo Gulf the country must have been densely wooded, a complete contrast to the present desolate condition, where the few trees that have survived the destructive native fires now stand miles apart from each other. The chalky, white limestone containing the elephant remains were overlain by greenish sandstones containing teeth of a hippopotamus and numerous bones of a baboon, but only the latter differs from its modern representatives. Hitherto baboons have only been found fossilised in the north of Africa, viz. in Algeria. (Plate facing p. 194.)

The task of searching for fossils in the dazzling white limestone was more trying to my eyes than ever before, for owing to the necessity of marching the distance of ten miles from Kendu it was during

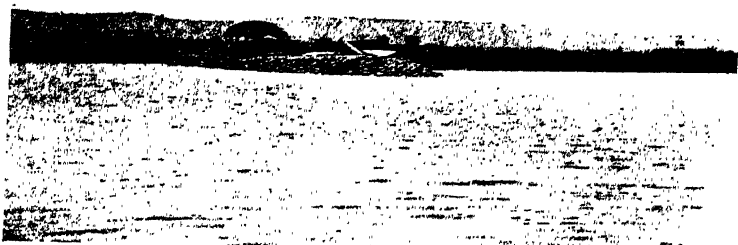
the middle of the day that I had to conduct my examination of the locality, and my eyes in consequence felt burnt in their sockets by the reflected heat of the noontide sun.

The ground falls away inland to form the wide depression of the Kimera swamp, which must at one time have been a lake impregnated with carbonate of soda like Lake Simbi, for along its margin the natives; here as there, collect the crystalline crust of the salt as it effloresces on the surface of the brown clay.

It was a welcome interruption to the pitiless glare of the open plain to seek shelter beneath the massive branches of the ancient sycamore fig that forms a conspicuous landmark for all vessels navigating the Kavirondo Gulf. It was with some amusement that I noticed the unabashed curiosity of the natives, who crowded round from all sides to see the solitary white man opening a tin of sardines or making soda-water in his sparklet syphon. The more venturesome climbed up the tree to get a nearer view and peered at me from the massive branches overhead, dodging behind them whenever I happened to glance upwards. My empty sardine tin was regarded as a cherished relic; and a maiden of some sixteen summers, innocent of even an ornament on her ebony skin, who strolled up at the end of my frugal repast to join in the peep-show, was greatly delighted at my explaining how a handful of sparklet bulbs could be made into



HOMA MOUNTAIN FROM THE NORTH-EAST
DEPOSITS CONTAINING EXTINCT ELEPHANT, BABOON, ETC., IN THE FOREGROUND.



KENDU FROM THE LAKE.

pendants to a necklace of a leather bootlace. An old woman, on the other hand, beamed in the sunniest manner at getting some tobacco and a box of matches; and finally a liberal distribution of cigarettes all round was the crowning feature of the show and put the meeting into a good humour.

It was with much reluctance that on this last day of my geological work I had to turn homeward without having by any means exhausted this interesting locality. I loaded up my five bearers with as many of the heavy bones as I could, but I had to endure their grumbling to an unmitigated extent at every halt. However, I managed to get them along by means of cigarettes coupled with the most uncomplimentary comparison of their feebleness in bearing burdens with the strength and sturdiness of their brethren at Karungu. During a halt at a little village to enable them to procure a drink of their favourite thin millet gruel in calabashes, I procured for myself a temporary popularity among the villagers by a lavish distribution of cigarettes and matches among the old women, the tobacco of the cigarettes being promptly crammed into the bowls of their long-stemmed pipes. Many of the natives in this part show good features and closely recalled some of my English friends in a most ludicrous manner, so that I could recognise without difficulty Mr. B., Mrs. S., or Miss N., but with an ebony skin, naked and unashamed!

On coming at last to the Awach river, I com-

menced, as usual, to take off my boots and puttees preparatory to wading through the stream, and just as I was entering the water I noticed one of my bearers wallowing in the river with evident enjoyment. (Plate facing p. 38.) It seemed a bright idea, and I resolved to follow suit. Without delay I went a little further upstream, and I was soon revelling in the most delicious bathe imaginable, though I had to keep on throwing water on my head to neutralise the efforts of the sun to drill a hole through my skull. Oblivious of everything else except the refreshing sensation, I was suddenly startled by a loud outburst of good-humoured laughter. All the women of the village had hurried up to the banks of the shallow river, and appeared to be vastly entertained at the white man enjoying a dip in the same state of nature as themselves.

It was six o'clock before I had finished the business of the day, paying off my men, upbraiding the headman for providing sour milk, etc., and then I could relax a little for the first time in twelve hours, but not for long, for it was midnight before I had finished my packing of specimens so as to be ready for the boat the next morning.

Whilst writing up my journal for the last time it suddenly struck me with much compunction that my faithful Mahomed had received no letter from his own people, and I quite won his heart by offering to write a note in Suaheli, at his dictation, to his wife Ayesha in Mombasa. It was a most artless

epistle, such as a child of seven might write, merely a succession of greetings (*salaam*) to his wife Ayesha and all his relations and friends, mentioned separately by name—in fact, every sentence ended with the words *salamu sana*.

The first news at sunrise was that the boat had come for me, yet there was still much to be done before I could embark. Nailing up my last box of bones and binding it round with iron ribbon, developing a last batch of films, discarding odd stores of which I could not dispose, I was scarcely able to find time for a hasty breakfast. A flying farewell visit to the Carscallens, and then I left Kavirondo land for ever, with a sigh of relief at being now able to turn my thoughts homeward with my task completed to the best of my ability. A brisk land-breeze soon drove us into the fairway, and Kendu faded away in the heat-haze. (Plate facing p. 194.) Hippos snorted at intervals, sea-gulls mewed and flocks of cormorants flew past with a mighty rustling of wings; but soon the fitful breeze died away in the noontide heat, and we lay becalmed beneath a sky of brass. Floating islands of papyrus drifted idly over the still, glassy waters. Much of the time I employed in the dull but necessary work of writing labels and tacking them on to my various boxes and packages. The *howdar* had respectfully greeted me as if he were really glad to see again his passenger of two months back; but this time I was not his only passenger. He had taken on at Kendu two

others who presented a striking contrast between the new and the old order of things, viz. a native policeman, dapper and spruce in his simple uniform of blue jersey, khaki shirt, bandolier and fez, engaged in escorting a new recruit to Kisumu. The raw material was a wild-looking Masai, naked except for the scantiest of loin-cloths, yet in a few months discipline would work wonders and he would soon tramp through the streets of Nairobi with as much self-assurance and sense of responsibility as the askari who was escorting him to the barracks. Similarly the Roman soldier of Hadrian's wall would have transformed the naked Caledonian savage, adorned with coils of wire, into a serviceable auxiliary, to be transported to guard the German boundary or to garrison a frontier-post in Africa or Armenia, far from his native shores.

We had to wait until sunset for a breeze to blow us to Kisumu, and darkness came upon us before we could make the port. When at last I saw once more its harbour lights, the electric lamps of the steamboat moored at the quay, and heard the welcome whistle of an engine on the Uganda Railway, it seemed as if I had suddenly bridged a period of two or three thousand years, stepping across at one bound to modern civilisation from a stage of primitive human culture, similar—though vastly inferior—to that of the early Britons before the Roman conquest.

CHAPTER XIII

BY RAIL TO THE COAST

AFTER tasting, even for a comparatively brief period, the freedom of marching through new country, and depending on my own initiative and resource, it was with mixed feelings that I boarded the train on the Uganda Railway at Kisumu. There was something humiliating in being turned into a parcel, in spite of the much-needed rest and relaxation, for I had now renounced the thrill of expectation which every traveller experiences on reaching the top of a hill, after indulging in speculations as to the possible nature of the country beyond.

A motley crowd gathered at the station : more or less naked natives, fussy Indian railway officials and Indian traders in cool cotton raiment, and a handful of Englishmen, homeward bound like myself. The most picturesque of all the passengers were some Indian women in gaily coloured *saris* ; one of them had a number of silver rings on each toe of her bare brown feet, and massive silver anklets, fully three inches in thickness. Although the custom is barbaric it is not without a certain charm.

For the first twenty-five or thirty miles the train passes over a wide grassy plain which had obviously been once covered by the waters of the lake. The ground is still very swampy in places, but the lower slopes of the hills bordering the plain are extensively cultivated by the Kavirondo. Here I caught my last glimpse of this tall athletic race: naked women bearing wicker baskets or water-jars on their heads, their well-greased, ebony skins gleaming in the sun. Trees only occur at scattered intervals and consist of a monotonous repetition of candelabra euphorbias or scraggy, spiny acacias, interspersed with the pinnacled mounds of termites. The train runs along the foot of the lofty Nandi Escarpment, rugged and precipitous, with serried columns of lava flows piled up one above the other.

After passing Kibigori we crossed the Nyando River and left the plain behind. At Muhoroni the railway bridges a fairly deep grassy glen where calcareous springs are still active. In the travertine deposited by the lime-laden waters Mr. Chesnaye had found some bones of an African elephant some months previously. I had hoped to have time to break my journey here in order to investigate this occurrence, but the extra days I had spent collecting fossil bones near Homa Mountain had completely used up all my margin of time.

Here the train commences its gradual ascent up to the Mau Escarpment, rising nearly 5000 feet

above the level of the Victoria Nyanza, and the line makes the most wonderful twists and turns in its efforts to seek the easiest gradients, especially between Fort Ternan and Londiani. The only tunnel of the line occurs on this stretch, in rocky country near Lumbwa. It is so short—only 500 feet—that the engineers seem to have almost gone out of their way to construct it in order to prevent the Uganda Railway from labouring under the stigma of being a line without a tunnel.

This district is one of the most attractive of the whole route, consisting of grassy hills with scattered trees. It is, in fact, a vast park, with so varied an aspect that one would like to linger even longer than the train permits, although its speed up the severe gradients is considerably less than its average fifteen miles an hour. Still, the train does its very best to allow the passengers time to admire the scenery from every point of view, for, in addition to many minor bends, a huge horse-shoe curve has been introduced at Lumbwa, and the line is carried from hill to hill across the deep ravines by numerous steel viaducts. In the seventy-six miles between Muhoroni and El Burgon there are no less than thirty-four bridges and quite three times as many cuttings. Most of these lofty bridges are of American origin, for the bridge builders in the United States were able at the time to promise more rapid delivery and lower prices than the British firms. Although some of the engines also

are American (built at the Baldwin works in Philadelphia), the latest engine is one of the powerful articulated compound Mallet engines, built by the North British Locomotive Co. in Glasgow. It is particularly adapted for climbing the steep and troublesome gradients which still abound on the Uganda Railway, although I could see many places where the old line had been abandoned for a new track with an easier gradient. This new engine can haul a load of 170 tons up a long gradient of 1 in 25 at 6 miles an hour, and a load of 200 tons up a bank of 1 in 40 at 12 miles an hour. In the 55 miles from Muhoroni at the edge of the plain up to the summit of the Mau Escarpment there is a difference in level of 4250 feet.

The difficulties of railway management are still further increased by the fact (to which I referred in an earlier chapter) that the engines have to be stoked with wood derived from the forests along the line. The numbered stacks of wood, cut into suitable lengths, are conspicuous features at the stations, and hundreds of natives are ceaselessly employed in felling trees to supply not merely the engines but the steamers on the lake. The engine-driver of my train told me that 400 cubic feet of wood are required for every 120 miles, and the railway is using from three to four million cubic feet every year. This is a severe strain on the capacity of the forests, especially since the natives are very wasteful in their methods, often cutting

the trees at a height of six feet above the ground. In fact, at the present rate of consumption, it is estimated by experts that the wood-fuel in the mile-zone of the Uganda Railway will be exhausted in three or four years. It is obvious even to the casual observer that the forests have been greatly thinned along the line of the railway, even in the chief belt of forest that occurs on the west side of the Great Rift Valley, between the summit of the Mau Escarpment and Nakuru at its foot. Here giant cedars (*Juniperus procera*, a kind of juniper allied to the tree utilised for lead-pencils) rise to a height of 150 feet, overtopping all the ordinary trees of the forest. Saw-mills have been established at Molo and Limuru, and assist the work of destruction. On the other hand, the Forestry Department is now active in counteracting the almost irreparable damage, in spite of the initial mistake in alienating large tracts of valuable forest to private individuals. It was gratifying to see natives engaged in carrying boxes containing young plants of Black Wattle (*Acacia decurrens*) to be planted out in enclosures. It is to be hoped that the suggested system of using Natal coal may soon come into force for the line from Mombasa to Nairobi, and that oil may be used for the remaining distance to the lake. The oil-fields that have recently been discovered near the Albert Nyanza will be an additional incentive for extending the line westwards from Kisumu through Uganda to

the Albert Nyanza and ultimately down the Nile valley to link up with the Sudan Railway. When this is done, the Uganda Railway may assume a strategical importance, for a through line from Alexandria to Mombasa would obviously be advantageous to Britain in case the Suez Canal should become blocked in time of war.

The greatest of all the many engineering difficulties incurred in building the railway were encountered in negotiating the descent of the two sides bounding the Great Rift Valley and cutting the zigzags in the precipices of the Mau and Kikuyu Escarpments, each rising about 2000 feet above the wide valley plains of this vast crack in the earth's crust. Yet the colossal cost of the whole undertaking, amounting to about £10,000 for every mile of track, would not be grudged if only for the fact that its completion brought about the extinction of the slave trade. But the Uganda Railway does not exist on a philanthropic basis: it is a paying concern and has completely belied the doleful prophecies and prognostications of Mr. John Burns and other politicians in its early days. In spite of comparatively low rates, the railway has paid its way from the beginning; in the first half of 1906 there was an excess of £40,000 over the expenses; and in 1911 the surplus amounted to £98,520. Goods are carried for about 2d. per ton-mile, and third-class passengers, that is to say natives, are carried for less than a halfpenny a mile. The

return journeys for first- and second-class passengers work out at 2.25d. and 1.12d. per mile respectively. A minor criticism which may, however, be made is that for a line endeavouring to attract wealthy tourists a little more comfort might with advantage and without great difficulty be introduced into the arrangements of the first-class carriages.

The beauty of the forest region extending from the Mau Escarpment down to the plains of the Rift Valley made me wish that my train had been climbing up these slopes with snail-like slowness instead of rushing down them. But it was night when I ascended this part on the journey to Kisumu, for the Administration arranges that the part of the track that is traversed by day on the inward journey is passed by night on the return journey.

The Mau Forest is the largest of the forests in British East Africa, but all that remained in my mind was a fleeting and kaleidoscopic impression of tall juniper cedars, yellow-wood pines (*Podocarpus*), muhugu or sandalwood trees, and the parasitic fig trees which envelop and choke the life out of the unwilling host (usually a muhugu) and finally take its place, snake-like lianes and creepers, bamboos in the wetter parts, and numberless other trees and shrubs vieing with each other in grace and beauty, with a thick, tangled undergrowth in which our bracken fern was often conspicuous. The air was laden with moisture : long

greybeard lichens hung in tangled festoons from the branches, and cushions of mosses covered the rocks in the cuttings; but this forest primeval owes its luxuriance not merely to the abundant rains, but largely to the immense thickness of red clay that has originated from the rotting and weathering of the rocks through untold ages. The black earth of the recent lavas of the Lake region has completely disappeared, and the red clay (sometimes over thirty feet thick in the cuttings) has been derived from older volcanic rocks and ancient crystalline rocks (gneisses). Wherever the forest has been cleared and destroyed torrential rains wash away the red clay, the ground becomes coated with a barren layer of ironstone (*murram*), and the luxuriant tropical forest is replaced by grassy parklands with occasional scrub of spiny acacias and candelabra euphorbias. The best method of preventing this fertile red clay from being washed away is to retain the forests on the hilltops and, wherever possible, to reserve the highest ridges for plantations.

The railway line across the grassy plains of the Rift Valley passes the lakes of Nakuru, Elmenteita, and finally Naivasha, the gem of all three, a paradise for the naturalist and the sportsman. The still, sleepy waters, margined by papyrus and blue water-lilies, looked tantalisingly inviting, as I was whisked by in the train. Flocks of pelicans, white ibises and cormorants were much in evidence, but

I could not see any sign of a hippopotamus, although they are not uncommon. The whole of the valley and the blue hills behind the lake became shrouded and blotted out in drenching rain, the temperature fell suddenly, and the general feeling of depression was heightened by the dismal appearance of the round huts of the natives, with smoke finding its way as best it could through the grass roof.

The plain is often swampy or else it becomes a dreary and desolate steppe with high grass and scattered blocks of black lava. Some cranes standing on the tops of stunted acacias caused the trees to look ludicrously top-heavy.

It is a long zigzag climb for the train up the eastern wall of the Rift Valley—the Kikuyu Escarpment—but the forest is not so thick as on the western wall. The view from the summit, however, is magnificent and inspiring in the extreme : the wide valley-plain extends to the north and south as far as eye can see, and is broken only by lakes gleaming in the sun or by the imposing volcanoes of Longonot, Suswa and many others. Here the line enters the country of the Wa-Kikuyu, eminent as destroyers of the forest and ardent cultivators of the soil. Their holdings are visible on all sides with flourishing crops of maize, bananas, beans, castor-oil plants, etc., and the children tend many herds of goats which assist in the destruction of the forests ; but plantations of Australian wattle

in all stages of growth testify to a realisation by the Administration that the forests are one of the main assets of a country possessing little mineral wealth. The forest glades were often gay with colour: the fire tree (*Erythrina*) flaunted its scarlet blooms, yellow *Cassias* were abundant, a horse-chestnut, graceful *Albizzias* like ash trees, the Kikuyu creeper (*Ritchiea*) with its fragrant white flowers, and festoons of *Begonia* which gives the East African honey its delicious flavour. Sun-birds flitted about, some with green backs and yellow breasts, another a metallic blue-green with a red chest, glossy starlings, plantain-eaters and the gayest of tropical butterflies.

From Kikuyu Station, at a height of 6700 feet, another extensive view is disclosed to the eastward over the wide Athi and Kapiti plains, bounded by long lines of blue mountains in the distance. The line has to descend 1300 feet in fifteen miles in order to reach Nairobi, surrounded on three sides by gently wooded hills.

Here the great lava plains of Athi and Kapiti commence, and the most impressive scene of the whole Uganda Railway is revealed to the passenger for many hours by the vast herds of game which still roam at will over these plains. Although herds of zebra, hartebeest, wildebeest and gazelles (Thomson's and Grant's) predominate, I noticed also numerous ostriches, impalla and waterbuck, and even a few giraffes in the distance. A jackal

slouched past in the tall grass; whilst secretary birds, bustards, cranes and francolins took even less notice of the train than the game animals. On these treeless, grassy steppes there are not even any termites' nests to break the monotony of the nearly level surface. Far away on the horizon the snowy mountain giants of Kenia on the north and Kilimanjaro on the south could be dimly seen through the heat haze.

At Ulu a number of Masai were waiting on the platform, their hair plastered with red ochre, a blanket loosely draped over one shoulder, some with corks in their ears, others with beads, all of them armed with long spears, 8 to 10 feet in length, with the points protected by balls, and lastly they were surrounded by the most indescribable odour. It seemed to be the greatest of all anachronisms to see these tall warriors, once the terror of East Africa, meekly climbing into a third-class carriage!

Here the line enters a picturesque and hilly country composed of ancient crystalline rocks often traversed by quartz veins. The gradients are again so steep on the inward journey that near Kiu a halt had to be made to get up steam. The inclines were climbed at hardly more than a walking pace, so that I could easily watch the large *Achatina* snails (with shells nearly a foot long) creeping and sliding over the moist herbage. A large dark blue wasp, trailing its long yellow legs behind it, easily out-

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distanced our train, the buzz of its wings resounding like an aeroplane.

Kiu marks the limit of the white man's country ; from this point towards the coast the district has a bad reputation for malaria and for harbouring ticks in great numbers, some of which are responsible for communicating relapsing fever. The coast-belt of tsetse fly extends up to Makindu, over 3000 feet above the sea.

As we passed through the varied landscape of this hilly belt of country, snowy Kilimanjaro came more distinctly into view, and this old volcano reminded me forcibly of Ararat as seen from the Armenian Highlands. Here and there red-barked acacias form a thin forest, and francolins are fairly abundant. It would probably pay to introduce into this unhealthy region the Indian Catechu acacia, which yields a valuable form of tannin, for it is one of the few trees that escapes the ravages of white ants, and would be invaluable for railway sleepers. It is enough to scatter the seeds broadcast, so that the trouble of planting would be reduced to a minimum.

Tsavo still keeps up to some extent its reputation for lions, immortalised in Colonel Paterson's thrilling book, for only the week before I travelled down to the coast an Indian railwayman had climbed a signal post to light the lamps when, on descending the ladder, he found, to his consternation, a lion waiting for him at the foot. Without

undue delay the terrified lamplighter scrambled up to his precarious perch at the top of the signal-post and waited anxiously for dawn, shivering in his scanty cotton garments during a long vigil through the chilly hours of a tropical night in the hills. The railway crosses the reedy bed of the Tsavo river, where the lions used to take cover in the daytime after their nightly raids on the coolies at the time of the construction of the line.

At Voi (a most malarious and unhealthy district) a good road leads to Moshi in the Kilimanjaro district, and by this highway the Uganda Railway used to tap the German commerce ; but the construction of the Usambara Railway has enabled the Germans to retain this trade within their own territory. Doubtless the extension of the German railway to the Victoria Nyanza will also exercise an adverse effect on the receipts of the Uganda Railway, which at present enjoys the monopoly of the trade from the German ports of the lake, Shirati, Mwanza and Bukoba.

From Voi the railway traverses the waterless region of the Taru plain, much dreaded by travellers in the old days of caravans. The soil is here a bright red sand, characteristic of tropical deserts ; the fine red dust penetrates every crack and cranny of the railway carriage, smothering the passenger and his belongings, so that it becomes a difficult problem to remove it from one's person with only the scanty resources of the lavatory accommodation.

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Isolated hills of gneiss rise here and there from the bush-steppe with its scattered thorny trees, giving the impression of a neglected orchard. Termites' nests are abundant, often in groups of ten or twelve pinnacles, some of which still enclose the trunk of a tree. The ubiquitous solanum and convolvulus shrubs are persistent weeds all along the line. It was quite a relief to come to one of the neat, trim stations with their fragrant gardens of frangipanni, oleanders, yellow Tecoma and elegant coral-plant. The Indian officials with their white suits and turbans convey a sense of coolness that is far from the reality. The hot air blows into the carriage as if from a furnace, and the vast plain seems endless with thorny acacias, aloes, the bizarre elephant's foot (*Streptocarpus*), four or five feet in diameter, and candelabra euphorbias, some of which have a graceful manner of growth recalling the Norfolk Island Pine.

Finally, the train, after innumerable wriggings as it follows the easiest gradients, comes down to the coast-belt; and the neighbourhood of the sea is indicated by groves of tall, graceful cocoa-nut palms, which are only able to flourish when within reach of sea breezes. Vegetation becomes luxuriant; here and there a pool of blue water-lilies, plantations of bananas, branching borassus palms, and finally the huge, gaunt, leafless baobab trees, the distant and overgrown relatives of our humble mallows.

At last we cross over to Mombasa island by a slender and lofty iron bridge over a deep, winding creek that leads to the splendid harbour of Kilindini, and a short run brings us into Mombasa itself, with its blinding white coral-limestone, its shady mango trees, its roofs a tangled mass of purple Bougainvillea. Its most impressive sight, however, is the ancient Portuguese fort, flying the blood-red flag of the Sultan of Zanzibar. The lonely figure of a black sentry pacing to and fro on its highest battlements recalled the times when the Portuguese sentries, during the long siege by the Arabs, scanned the sea in vain for the ships that came too late.

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